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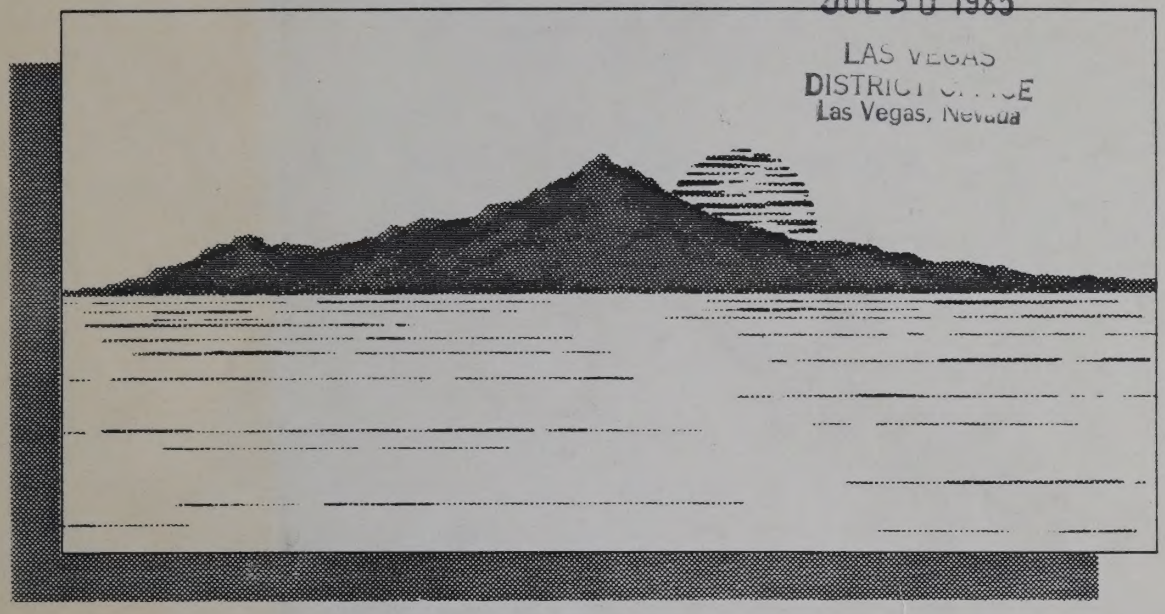

MEAD/McCULLOUGH–VICTORVILLE/ADELANTO

TRANSMISSION PROJECT

TECHNICAL REPORT

VOLUME I
OBJECTIVES, PROCEDURES
AND RESULTS

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MEAD/McCULLOUGH-VICTORVILLE/ADELANTO TRANSMISSION PROJECT TECHNICAL REPORT

VOLUME I OBJECTIVES, PROCEDURES AND RESULTS

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Prepared by:

Dames & Moore

Prepared for:

Los Angeles Department
of Water and Power
U.S. Department of the Interior
Bureau of Land Management

June 1985

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MEAD/McCULLOUGH-VICTORVILLE/ADELANTO TRANSMISSION PROJECT

TECHNICAL REPORT

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MEAD&NEWCOMET-CULLALOOCHA-VICTORVILLE/ADELANTO
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CHAPTER 1 - OBJECTIVES, PROCEDURES AND RESULTS

INTRODUCTION

The Los Angeles Department of Water and Power (DWP) and other project participants propose to design, construct, operate and maintain a 500 kilovolt (kV) alternating current (AC) or direct current (DC) transmission line from the Mead or McCullough Substation near Boulder City, Nevada to the Victorville or Adelanto Substation in California (see Figure 1-1). The proposed project will connect southern California to out-of-state energy resources in the Inland Southwest (Arizona, Nevada, New Mexico and west Texas). The project participants include M-S-R Public Power Agency (cities of Santa Clara and Redding, and the Modesto Irrigation District), U.S. Department of Energy, Western Area Power Administration (Western), Salt River Project (SRP), and members of the Southern California Public Power Authority (SCPPA), including DWP.

An Environmental Report (ER) was prepared, constituting a joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR), in compliance with the National Environmental Policy Act of 1969 (NEPA) and the California Environmental Quality Act (CEQA), respectively. The United States Department of the Interior, Bureau of Land Management (BLM) is the Federal lead agency (NEPA), and DWP is the state lead agency (CEQA).

STUDY OBJECTIVES

The objectives of the planning and environmental studies for the Mead/McCullough-Victorville/Adelanto Transmission Project were (1) to assist in defining locational alternatives, (2) to assess the environmental impacts of the proposed 500kV AC or DC transmission line and associated facilities, and (3) to prepare an ER. This Technical Report provides detailed documentation of the environmental studies conducted in support of the ER. The Technical Report consists of five volumes and eleven chapters, as follows:

Volume I - Objectives, Procedures and Results

Chapter 1 - Objectives, Procedures and Results

Volume II - Natural Environment

Chapter 2 - Air Quality/Meteorology
Chapter 3 - Earth Resources
Chapter 4 - Biological Resources

Volume III - Human Environment

Chapter 5 - Land Use
Chapter 6 - Visual Resources
Chapter 7 - Socioeconomics
Chapter 8 - Electrical, Biological, Health and Safety Effects

Volume IV - Cultural Environment

Chapter 9 - Archaeological Resources
Chapter 10 - Historical Resources
Chapter 11 - Ethnological Resources

Map Volume

Accompanies the ER, and contains all figures and tables not included in the Technical Report.

STUDY AREA OVERVIEW

The environment potentially affected by the proposed project lies within portions of Clark County, Nevada and San Bernardino County, California. Most of the study area is sparsely populated, but does include urban areas such as Boulder City in Nevada and Baker, Barstow, Victorville, Adelanto, Kramer Junction, and others in California.

The majority of the study area is in the Mojave Desert Physiographic Province, typified by broad alluviated basins between relatively isolated mountain ranges and dissected uplands. Mountain elevations range from 1,000 to over 4,000 feet, and local relief varies from extreme along the mountains to very low in the alluvial valleys. Paleontological resources within the study area are limited in regional extent and include the Barstow formation or equivalent rock strata of middle Tertiary age.

The climate of the area is typical of the region, with hot, dry summers and cool, dry winters. Precipitation is sparse and infrequent. The hydrology of the study area is characterized by internal drainage into the Mojave River, Kingston Wash, or one of the many dry lakes present in the area. Ground water within the Mojave Desert generally occurs in large basins. Shallow ground water is typically present in the dry lake beds, and is usually of poor quality due to total dissolved solids.

The major types of vegetation in the study area include creosote bush scrub, saltbush scrub, blackbush scrub, Joshua tree woodland, pinyon-juniper woodland, desert wash scrub and woodland, riparian woodland, and Mojave montane forest. These vegetation types support a variety of amphibians, reptiles, birds and mammals. Wildlife species of particular concern in the study area are legally protected species, including the Gila monster, desert tortoise, Swainson's hawk, California yellow-billed cuckoo, Least Bell's Vireo, and the Mohave

ground squirrel. There are also a number of special-interest plant species in the study area (designated as "BLM sensitive species"), but no legally protected plants occur in the area. In addition, three wildlife species of special interest occur in the project area: the golden eagle, ferruginous hawk, and desert bighorn sheep.

Land jurisdictions fall into six categories: National Park Service, public land (BLM), military reservation, California State School land, incorporated areas, and private lands. The majority of the alternative corridors cross BLM and private lands. Existing land uses include residential, public, commercial and industrial, agriculture, air facilities, and vacant lands. Urban areas include incorporated cities, the residential segment of George Air Force Base, and large-lot residential subdivisions. There are several solar energy plants located within the study area, along with numerous existing transmission lines and pipelines. Agricultural land is limited in the area, and generally is concentrated along the Mojave River and adjacent valleys. There are seven airports in the area, as well as low-level training routes associated with George Air Force Base. Major highways in the area include Interstate 15 (I-15) and 40, U.S. Highways 395 and 95, and a number of state highways.

Park, recreation and preservation lands within the study area include Lake Mead National Recreation Area, approximately two miles southeast of Mead; the Rainbow Basin National Natural Landmark, eight miles north of Barstow; the East Mojave National Scenic Area, in the east-central portion of the study area; and portions of 15 BLM Wilderness Study Areas, and 10 BLM Areas of Critical Environmental Concern. State areas include the McCullough Mountain Nevada Natural Heritage Site, 11 miles southwest of Mead, and nine California Natural Areas. In addition, there are a number of campgrounds, scenic drives, cycle courses, and parks.

Along the study corridors, archaeological sites include habitations, lithic scatters, quarry/workshops, rockshelters, milling stations, roasting pits, rock features, and rock art sites. Two sites are listed in the National Register of Historic Places. Most of the historical sites in the study area relate to transportation and mining, and areas of high historical sensitivity were identified in the Valley Wells/Rosalie and Forks-in-Road areas. The study area does not encompass any contemporary Indian lands, but does include the traditional range of a number of aboriginal Native American tribes. Most of the sites inventoried are coterminous or associated with archaeological resources.

STUDY PERSONNEL

Since April 1984, Dames & Moore has served as a consultant in conducting the environmental studies and preparing major portions of the ER for the Mead/McCullough-Victorville/Adelanto Transmission Project. The environmental investigations for this project were conducted by an interdisciplinary team under the direction of Dames & Moore. In addition to team management, Dames & Moore conducted all resource studies except electrical effects

investigations. The personnel and organizations responsible for the various studies are shown below.

Dames & Moore Management

Responsibility	Personnel
Project Director	John Robinson
Project Manager	Garlyn Bergdale
Project Coordinator	Lucy Bowen
Report Production Manager	Shirley Wiley
Graphics Preparation	Mitch Meek

Resource Study Teams

Responsibility	Organization	Key Personnel
Air Quality/Meteorology	Dames & Moore, Santa Barbara	Cynthia Folks
Earth Resources	Dames & Moore, Los Angeles, Santa Barbara	Roy Patterson Robert Troutman
Biological Resources	Dames & Moore, Santa Barbara	John Gray
Land Use	Dames & Moore, Phoenix	Ralph Kingery Mark Schaffer
Visual Resources	Dames & Moore, Phoenix	Jim Jensen Garlyn Bergdale
Socioeconomics	Dames & Moore, San Francisco	Robert Mott
Archaeological Resources	Dames & Moore, San Diego	James Cleland
Historical Resources	Dames & Moore, San Diego	James Cleland
Ethnological Resources	Dames & Moore, San Diego	Clyde Woods
Electrical, Biological, Health and Safety Effects	Consultant	Robert Banks
	Consultant	T. Dan Bracken
	University of Rochester Medical Center	Morton Miller
	New York State Institute for Basic Research in Developmental Disabilities	William Bailey
	POWER Engineers, Inc.	Don Angell

PROJECT DESCRIPTION

As a result of systems investigations, the Project Sponsors propose the Mead/McCullough-Victorville/Adelanto Transmission Project. The proposal includes a 500kV AC or DC transmission line, modifications to existing substations, a converter terminal modification to existing communication facilities, and a ground electrode (converter station and ground electrode for a DC system only). For a DC line, power would be transmitted from Mead to Adelanto. An AC transmission line would begin at McCullough and end at either Victorville or Adelanto. Power transfer capability will be from a nominal 1,000 MW to a nominal 2,000 MW, depending on whether the transmission system is AC or DC, respectively. Construction of the line is planned to begin in 1989, with an in-service date of 1991.

Transmission Line

Electrical Design

The design, construction, operation and maintenance of the Mead/McCullough-Victorville/Adelanto 500kV transmission line will meet or exceed the requirements of the National Electrical Safety Code (NESC), U.S. Department of Labor Occupational Safety and Health Standards, California Public Utilities Commission (PUC) General Order No. 95, and DWP's own requirements for maximum safety and protection of landowners and their property.

Line Design

Towers - Towers for the proposed 500kV transmission line will be freestanding lattice-type made of unpainted galvanized steel. Typical AC and DC suspension tower configurations, tower designs and foundation details are shown on Figure 1-2. Typical tower-to-tower spans are anticipated to be approximately 1,200 to 1,400 feet.

Free-standing square-based towers will be used along the entire route. Typical tower height will range between 120 and 130 feet. A dead-end tower will be required at each end of the line, at some angle positions along the line, at heavily loaded tower locations, and at specific utility crossings for added safety. The remaining towers will be suspension or angle suspension. They are of the same basic configuration as suspension towers, the difference being in the insulation systems and tower weights.

Foundations - Four foundations for each tower will be required; each would be drilled pier cast-in-place concrete. A typical free-standing tower foundation consists of a steel stub angle for tower attachment, and a concrete base 2.5 to 4 feet in diameter and 14 to 25 feet in depth.

Conductors - Electrical conductors, a positive and negative pole, provide the medium over which electrical energy flows in a DC transmission line.

Electrical energy would be transmitted by a three-conductor bundle for each pole with a spacing of at least 18 inches between subconductor centers. For an AC transmission line the conductor would consist of three phases, with a two-conductor bundle for each phase. Spacing between subconductor centers would be 18 inches.

Each conductor is expected to be aluminum trapezoidal or aluminum stranded conductors with a steel stranded reinforced core (ACSR). The aluminum carries the majority of the electrical current, and the steel increases tensile strength to support the aluminum strands.

Minimum conductor height above the ground is 35 feet, based on General Order No. 95. The exact height of each tower would be governed by topography and safety requirements for conductor clearance.

Insulators and Associated Hardware - Two strings of insulators in the form of a "V" will be used to position and support the conductors relative to the tower while maintaining electrical design clearance between the conductors and the tower (Figure 1-2). Each string will consist of 26 to 32 insulators on each leg of the "V," and be between 14 to 20 feet long.

Overhead Groundwires/Neutral Return - To protect conductors from direct lightning strikes, two overhead groundwires 3/8 to 7/16 inch in diameter will be installed on the top of the towers. With these groundwires, current from lightning strikes can be transferred through the groundwires and structures into the ground. A neutral return wire, approximately 1 to 1½ inches in diameter, would replace the ground wire if used in the DC alternative.

Right-of-Way Acquisition

In general, new land rights will be required for the transmission line and transmission line access roads. Non-Federal lands necessary for the transmission line right-of-way and additional land, if necessary, for substations will be purchased in fee simple. Non-Federal lands necessary for the access road right-of-way will be obtained in perpetual easements. The land rights will be obtained in the name of the City of Los Angeles. Every effort will be made to purchase all the land rights on private lands through reasonable negotiations with the present owners; however, the right of eminent domain will be exercised in those instances where the negotiations are not successful. A grant of a 200-foot right-of-way will be requested for portions of the transmission line within the Federal lands from the BLM.

Based on growth trends, it appears that the land adjacent to the portion of the proposed transmission line route north from the Adelanto Substation to Highway 395, and along portions of the BLM contingency corridor (Corridor P, as identified in the California Desert Conservation Area (CDCA) Plan, 1980) paralleling Highway 395, will be much sought after for future development. In

total, BLM utility corridors, coupled with land use constraints, provide a limited number of options available for the routing and location of electric transmission facilities.

While present DWP projections do not call for an additional transmission line in this area, it is anticipated that another as yet unplanned transmission line could be needed over the long term to accommodate future Inland Southwest generation resources. In the event that it becomes necessary to import additional power from future Inland Southwest resources, there could be a serious routing problem for such a transmission line in the Adelanto area, based on anticipated growth. Therefore, a 330-foot right-of-way from Adelanto north to and along portions of BLM's contingency corridor (Corridor P, CDCA Plan) along Highway 395, will be required on private land for the proposed transmission line and a future transmission line. If no provisions are made in this area for the likelihood that a transmission line could be required in the future, a future transmission line would require an additional 130-foot right-of-way that could create greater impacts on the environment than would occur if a 330-foot right-of-way were provided in this project. The additional 130-foot right-of-way for a future transmission line would mitigate future impacts and assist in present and future land use planning. For this reason, the rights-of-way on private property for the portion of the proposed transmission line route north from Adelanto to Highway 395 and along portions of the BLM contingency corridor are proposed as 330-foot-wide rights-of-way, rather than 200 feet. It is important to note that any future transmission line project would be assessed in a separate environmental document.

Construction

Construction of a transmission line normally follows a sequence of surveying the centerline, access road construction, clearing right-of-way and tower sites, installing foundations and towers (including construction yards and batch plants), assembling and erecting the towers, stringing, tensioning, clipping conductors, installing of counterpoise, and cleanup and restoration (Figures 1-3 and 1-4). The number of workers and types of equipment required to construct the proposed transmission line are shown on Table 1-1.

Surveying Activities - Before construction surveying begins, it will be necessary to obtain either a survey permit on Federal and state lands, or right-of-entry for privately owned land. Construction survey work will consist of tower center hub surveys and access surveys. All of these activities will begin approximately 2½ years prior to the start of construction.

Access Road Construction - Transmission line construction requires the movement of large vehicles along the right-of-way. If new access roads need to be constructed, they must be able to support the weight of these vehicles.

Unpaved access roads will be required for the construction, operation and maintenance of the proposed transmission line. Existing roads will be used

when the right-of-way closely parallels a utility corridor, or where other existing roads provide adequate access to the line. Where existing roads can be used, only spur roads to the tower sites will be required. Main and spur access roads will be constructed on the right-of-way where existing roads are lacking. If adverse conditions exist, such as the need to avoid sensitive resources, difficult topography or landowner requirements, the access roads may have to be located outside of the right-of-way. Spur roads are estimated at 0.25 mile per mile of line where adequate main access roads exist and 0.5 mile per mile of line in mountainous terrain; 0.75 mile per mile of line where existing access roads must be upgraded; and 1.5 to 2.0 miles per mile of line where all new access roads are required. Table 1-2 provides a link-by-link estimate of access road requirements.

Wherever possible, roads will be built at right angles to streams and washes. Culverts will be installed where necessary. In addition, road construction will include dust-control measures in sensitive areas. All existing roads will be left in a condition equal to or better than their condition prior to the construction of the transmission line.

All roads will be constructed in accordance with the applicant's requirements for transmission line access roads. In the event of a conflict between the applicants' requirements and the requirements of the BLM, the states of California and Nevada or other agencies, the requirements of the governing agencies will take precedence.[1] Landowners along the proposed roads will be consulted before construction begins.

Tower Site Clearing - At each tower site, leveled areas (pads) will be needed to facilitate the safe operation of equipment, such as construction cranes. The leveled area required for the location and safe operation of large cranes will be approximately 30 by 40 feet. At each tower site, a work area approximately 200 feet square will be required for the location of tower footings, assembly of the tower, and the necessary crane maneuvers. The work area will be cleared of vegetation only to the extent necessary. After line construction, all pads not needed for normal transmission line maintenance will be graded to blend as near as possible with the natural contours, and revegetated where required.

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[1] The BLM has provided DWP with the following access road stipulations: (1) use existing roads without widening wherever possible; (2) expand substandard roads and trails to the minimum size access roads; and (3) where new roads are necessary, they should be constructed to provide a minimum size access road with erosion prevention drainage devices (water bars, ditches, etc.). The BLM further stated that, " As a general policy in relatively level areas or areas of gentle slopes, which have scattered low vegetation and are not excessively rocky, we prefer roads be established by lathes and flagging and use of rubber-tired vehicles, with no grading and clearing" (BLM 1985).

Clearing Right-of-Way - The clearing of some natural vegetation may be required; however, selective clearing will be exercised and be performed only when necessary to provide for surveying, electrical clearance, line reliability, and construction and maintenance operations. Topping or removal of mature vegetation, under or near the conductors, will be done to provide adequate electrical clearance as required by the NESC standards and California PUC General Order No. 95. Trees that could fall onto the lines or affect lines during wind-induced line swing will be removed. Normal clearing procedures are to top or remove large trees and not disturb smaller trees. In critical areas the removal of trees will be jointly reviewed and agreed upon between the sponsors and the owners or managers of the property. Rights-of-way will not be chemically treated unless necessary to comply with requirements of a permitting agency.

Foundation Installation - Excavations for foundations will be made with power equipment. In areas where the soil permits, a vehicle-mounted power auger will be used. In rocky areas, the foundation holes may be either excavated by drilling and blasting, or special rock anchors may be installed. After excavations are completed for a tower foundation, a footing is installed by inserting a reinforcing bar cage and encasing it in concrete (cast-in-place). Spoil material will be used for fill where suitable. The foundation excavation and installation requires access to the site by a power auger or drill, a crane and ready-mix trucks.

Construction Yards and Batch Plants - Temporary construction yards will be located near each end and at locations approximately 20 to 30 miles apart along the route. Concrete for use in constructing foundations will be dispensed from a portable concrete batch plant located at approximately 20-to-30 mile intervals. A rubber-tired flatbed truck and tractor will be used to relocate each plant along the right-of-way. Commercial ready-mix concrete may be used when available within a one-hour drive of the construction site. The yards/batch plants will serve as reporting locations for workers, parking space for vehicles and equipment, sites for material storage, and stations for equipment maintenance. Facilities will be fenced and their gates locked. Security guards may be stationed where needed.

Tower Assembly and Erection - Bundles of steel are shipped and assembled into towers at each tower site. Transportation of the steel and associated hardware to the tower site will be by truck. The assembled sections are hoisted into place by a large crane and then fastened together to form a complete structure. Table 1-1 lists the equipment and personnel necessary. Figure 1-3 shows the sequence of construction.

Conductor Installation - After towers are assembled and insulators and stringing blocks are installed, the transmission line is then ready for the installation of the conductors (Figure 1-4). The towers are rigged with stringing blocks at each conductor or groundwire position. Pulling lines are strung through each block in each position on the tower, then the conductors are attached to the ends of the lines and pulled through the blocks.

Once in the blocks, the conductors are sagged, or brought to a specified ground clearance through use of conductor tensioning equipment. At the pulling site this tensioning machinery will occupy an area of about 200 by 200 feet. Pulling sites will be required about every two miles.

After the tensioning of the conductor, the groundwires and conductors will be attached with connectors to insulators and hardware to each tower. During wire installation, temporary guard structures will be erected to protect crossings of highways, other utility lines, roads and railroads. Guard structures, which are wood poles, require the digging of holes for their installation and are removed at the completion of the conductor stringing operation.

Counterpoise Installation - As a part of standard construction practices prior to wire installation, tower footing resistance along the route is measured. If the resistance to remote earth for each transmission tower is greater than 20 ohms, counterpoise (grounds) are installed to lower the resistance to 20 ohms or less.

Cleanup and Removal - Construction sites, material storage yards, and access roads will be kept in an orderly condition throughout the construction period. Refuse and trash will be removed from the sites and disposed of in an approved manner. Oils and fuels will not be dumped along the line. Oils or chemicals will be hauled to an approved site for disposal. No open burning of construction trash will occur without BLM approval.

Site Reclamation - The right-of-way will be restored as required by the property owner or agency. Every effort will be made to restore the land to its original contour and to restore natural drainage along the right-of-way as required. The reclamation will involve the personnel and equipment as shown in Table 1-1. The total construction period will be approximately two years.

Fire Protection - All applicable fire laws and regulations will be observed during the construction period. All personnel will be advised of their responsibilities under the applicable fire laws and regulations.

Operation

Operational Characteristics - The nominal voltage for a Mead to Adelanto DC transmission line project would be ±500kV DC. There may be minor excursions of up to plus five percent above the nominal level depending upon load flow.

The nominal voltage for a McCullough to Victorville/Adelanto AC transmission line project would be 500kV AC. The voltage could be as high as 550kV at McCullough, while dropping to approximately 500kV at either Victorville or Adelanto.

Permitted Uses - After the transmission line has been energized, land uses that are compatible with safety regulations will be permitted in and adjacent to the right-of-way. Existing land uses such as agriculture and grazing are

generally permitted within the right-of-way. Incompatible land uses within the right-of-way include construction and maintenance of inhabited dwellings, and any use requiring changes in surface elevation that would affect existing or planned facilities.

Land uses that comply with local regulations will be permitted adjacent to the right-of-way. Compatible uses of the right-of-way on public lands will have to be approved by the appropriate agency. Permission to use the right-of-way on private lands will have to be obtained from the utility owning the transmission line.

Safety - Safety is a primary concern in the design of this 500kV transmission line. A DC transmission line would be protected at both ends with valve controls. An AC transmission line would be protected with power circuit breakers and related line relay protection equipment. If conductor failure occurs, power will be automatically removed from the line. Lightning protection is provided by overhead groundwires along the line. Electrical equipment and fencing at the substation will be grounded. All fences and metal gates crossing or within the transmission line right-of-way will be grounded to prevent shock potential.

Maintenance

The 500kV transmission line will be inspected on a regular basis by both ground and air patrols. Maintenance is performed as needed. When access is required for nonemergency maintenance and repairs, the sponsors will adhere to the same precautions that were taken during the original construction.

Emergency maintenance will involve prompt movement of repair crews to repair or replace any damage. Crews will be instructed to protect crops, plants, wildlife and other resources of significance. Restoration procedures following completion of repair work will be similar to those prescribed for normal construction. The comfort and safety of local residents will be provided for by limiting noise, dust and the danger caused by maintenance vehicle traffic.

Abandonment

Dismantling - At the end of the useful life of the proposed project, if the facility were no longer required, the transmission line will be abandoned. Subsequently, conductors, insulators and hardware will be dismantled and removed from the right-of-way. Tower structures will be removed and foundations broken off below ground surface.

Future Uses - When and if the line and associated right-of-way are abandoned at some future date, the right-of-way will be available for the same uses possible prior to construction of the project.

Site Reclamation - Following abandonment and removal of the transmission line from the right-of-way, areas leveled for equipment required to dismantle the line will be restored as near as possible to their original condition.

Ground Electrode/Neutral Return

For a DC transmission line, a ground electrode will be required. DC operates at a fixed or non-oscillatory voltage. The positive pole operates at +500kV and the negative pole operates at -500kV. Each pole is controlled individually during normal operation. A small variation in pole equipment characteristics results in a small unbalance of current of the two poles. A ground return path between the two terminals is required to accommodate this unbalanced pole current, and for full current for short periods in the event of an emergency interruption in normal operation of one of the poles (positive or negative) of the conversion equipment. The return path would be provided through the earth by either a ground electrode or a neutral return line.

Ground Electrode System Components

The ground electrode consists of a metallic or carbon element(s) surrounded by a coke backfill material buried in the ground as a method of passing current into the earth. Low resistivity soils, underlying rock and availability of moisture for good electrical conductivity are important factors in the location of ground electrodes.

A typical design would be a shallow ring-type electrode which consists of an approximately 1½ inch diameter mild steel rod in a coke backfill material buried from 10 to 12 feet deep. The ring diameter varies depending on design parameters and the soil properties of the electrode site (Figure 1-5).

Another design employs multiple deep vertical electrodes arranged in a circular, linear or rectangular pattern. Each vertical electrode consists of carbon elements in a deep well with a coke backfill material. The well is approximately 12 inches in diameter while the well depth is a function of the underlying earth resistivity, soil characteristics, and availability of moisture for good electrical conductivity (Figure 1-5).

The ground electrode line would be carried on a separate distribution-type pole structure or the DC transmission line structures. The distribution-type pole would be a precast concrete or tubular steel pole approximately 55 feet high (Figure 1-6). Approximately 10 miles of distribution-type line to the ground electrode would be built, if necessary, as a part of a DC project.

The ground electrode line in the area of Mead was addressed in the Mead-Phoenix Project Draft EIS. A location for the potential ground electrode for the Adelanto terminal is uncertain. One option would be to place it in the Coyote Dry Lake area northeast of Barstow, possibly tapping into and expanding the Intermountain Power Project (IPP) ground electrode.

Construction

The method of installing the ground electrode would vary depending upon which alternative is chosen. The number of construction personnel at each site would be small due to the limited nature of the facilities. Construction at the site would consist of: access road construction and site grading (if necessary), drilling wells or burying of feeder cable, backfill, well development (if required), and cleanup. Construction of the ground electrode line would be similar to the construction of a distribution line.

Operation

The ground electrode site would be unmanned. The area around the ground electrode site may be fenced for security.

Maintenance

Periodic inspection of the ground electrode site would be required. Maintenance of facilities would be performed as needed. When access is required for maintenance and repairs, the Project Sponsors would adhere to the same precautions that were taken during the original construction.

Neutral Return

An alternative to a ground electrode for the Adelanto end of the transmission line would be a neutral return line. This line would replace the ground wire at the top of the DC transmission tower (Figure 1-2) and would run back to Mead where it would be connected to the ground electrode facilities as construction for the Mead-Phoenix Project.

Converter Station

A new 2000 MW, 500kV DC converter terminal including associated electrical equipment will be located within the area adjacent to, and south or west of, the existing Adelanto Converter and Switching Station, as shown on Figure 1-7. The land requirements would be from 120 to 180 acres depending on converter valve cooling requirements, storm bypass channel design, layout of associated electrical equipment, and potential allowance for setbacks from or relocation of existing electric and gas transmission lines.

The converter terminal would include two thyristor valve halls, a control building, electrical towers and rack structures, a DC electric equipment yard, valve water cooling/evaporation ponds, an AC electrical equipment yard, an AC equipment yard control house, internal access roads, parking, and potentially a storm bypass channel.

The two thyristor valve halls would each be approximately 75 feet wide by 200 feet long by 90 feet high. The control building for the valve hall equipment would be approximately 100 feet wide by 100 feet long by 25 feet high. If the two valve halls and the control building were integrated as one contiguous structure the plan dimensions would be on the order of 75 feet wide by 400 feet long, with the height remaining approximately 90 feet. The integrated valve halls and control building would approximate the existing valve halls and control building on the adjacent existing converter station site.

The electrical towers and rack structures would be similar in appearance and height to those on the existing converter station/switching station site; that is, with a maximum height of approximately 125 feet. The DC and AC electrical equipment yards will be open and include transformers, circuit breakers, disconnect switches, lightning/surge arresters, filters, capacitors, and bus (conductor) structures. The AC equipment yard control house, a structure approximately 50 feet wide by 100 feet long by 25 feet high, the internal access roads and storm bypass channel would all be similar to what is now existing on the adjacent existing site. A water-cooling tower with water treatment plant (approximately 80 feet long, 50 feet wide and 50 feet high), and an approximate six-acre evaporation pond may be required if the thyristor valves are cooled by water. The proposed facilities would be enclosed by chain-link fencing for security.

The site preparation work will involve:

1. Cut-and-fill grading and placement and compaction of structural fill to serve as a foundation for the converter station facilities. The site will be graded to maintain current drainage patterns.

2. A new construction entrance and construction fencing will be provided.

3. Approximately 20-foot-wide paved secondary roads and 30-foot-wide paved primary roads will be required. The AC and DC yards will be covered with aggregate. A paved parking area, approximately 100 feet by 100 feet, will be required. Landscaping adjacent to the valve halls and control building will be provided. Where possible, original vegetation will be re-established.

4. Four 500kV AC and four 220kV AC double circuit transmission towers may require relocation or modification within the site.

Communications Facilities

Each terminal has an existing telecommunications system utilizing microwave radio facilities for protective relaying, supervisory control, and power dispatching purposes. A telecommunications system can control the transmission line automatically from remote locations and is required to insure the

reliability of the power system. The system also provides voice communication circuits to coordinate activities in operating and maintaining the transmission line.

For either an AC or a DC transmission line, three to four new channels will have to be added to existing microwave equipment. In addition, for a DC line, changes to the existing equipment at Mead will be necessary, as well as the addition of antennas to existing facilities between Mead and Boulder City.

One man will be needed to expand the channel capacity at each terminal. For a DC line during peak construction periods, approximately three men will be required to make the changes to existing equipment at the Mead Substation. Approximately six men will be needed to add the antennas to the existing facilities between Mead and Boulder City. Construction at all sites will consist of equipment installation.

These communications facilities are unmanned and operate automatically. The building is fenced, locked and secured, and entry is restricted to appropriate utility personnel. The maximum microwave transmitter power at each facility is five watts.

Maintenance of the proposed communication facilities consists of testing, repair and replacement of electronic equipment located within the building at the communication site. Inspection and maintenance of the building, communication tower, and other physical equipment will occur periodically.

At the end of the proposed project life and if the facilities were no longer required for other existing or proposed projects, the microwave sites will be abandoned. Subsequently, the equipment will be dismantled and removed from the sites.

Schedule and Budget

Construction and operation scheduling for the proposed project are shown in Table 1-3. Estimated capital cost for the proposed project is in escalated dollars. Table 1-4 shows the approximate cost for each major project element.

SCOPING PROCESS

In response to the NEPA and the CEQA, DWP and the BLM completed a number of scoping activities to determine the significant issues to be analyzed, and the scope with which they were to be treated in the environmental statement. Scoping was also used to eliminate issues and alternatives from detailed study, where appropriate. Information developed during the scoping process formed the basis of the identification of alternatives and the development of the work plan for the environmental baseline, impact assessment, and mitigation planning studies undertaken for the proposed project.

The scope of these studies was developed through a comprehensive and systematic process involving the tasks described below.

Task 1 - Review Previous Studies

Existing published and unpublished environmental data, reports and statements prepared for previous transmission line projects in the area were reviewed and evaluated to determine applicability and adequacy for use in the environmental studies. The most relevant information was included in four major reports:

- Allen-Warner Valley Energy System
  Final EIS (BLM 1979)

- Draft Environmental Impact Report (EIR)
  Allen-Warner Valley Energy System and Western Transmission Lines
  (California PUC 1980)

- IPP
  Final EIS (BLM 1979)

- The CDCA Plan (BLM 1980)

Task 2 - Conduct Subregional Siting Study

Based on initial meetings between DWP and BLM it was determined that data developed during previous studies were adequate for corridor identification along I-15. The I-15 Corridor has been designated as a utility corridor in the CDCA Plan (1980) by the BLM and is clearly defined both as to its location and intended use from the California-Nevada border area to the Barstow-Victorville area.

In the Barstow-Victorville area, the predominant pattern of land ownership shifts from public (BLM) to private. In this area the I-15 Corridor is less well defined; it becomes an "indicated" route on the CDCA Plan map - shown with a dashed line. Because of the uncertainty surrounding the corridor location and the complexity of land use patterns in the Barstow-Victorville area, a subregional routing study was undertaken by DWP, in the area shown on Figure 1-8. The regional-scale environmental data collected during this study are summarized on Table 1-5. The study identified feasible transmission line routes from the general vicinity of Barstow to both Victorville and Adelanto.

An agency contact program was also initiated at the same time, and consisted of the following meetings:

City of Adelanto, California	May 24, 1984
George Air Force Base, California	May 29, 1984
City of Victorville, California	May 29, 1984
Bureau of Land Management Barstow, California	May 30, 1984
City of Barstow, California	May 30, 1984
San Bernardino County, California Planning Department	May 31, 1984
Bureau of Land Management Riverside, California	May 31, 1984

Summaries of these meetings are presented in Appendix I-A.

Task 3 - Publish Notice of Assessment

A Notice of Assessment (NOA) was published by DWP on July 6, 1984 to solicit "responsible and trustee" agency comments on the intended preparation of an Environmental Assessment (EA). The NOA also noted that the BLM would be preparing an EA. One response was received from the U.S. Fish and Wildlife Service (USFWS) (see Appendix I-A).

Task 4 - Conduct Scoping Meetings

Four public scoping meetings and four agency contact meetings were held in the project area, as follows:

Clark County, Nevada Planning Department	July 23, 1984
Boulder City, Nevada Public Meeting	July 23, 1984
Baker, California Public Meeting	July 24, 1984
Barstow, California Public Meeting	July 25, 1984

Victorville, California Public Meeting	July 26, 1984
Edwards Air Force Base, California	July 26, 1984
George Air Force Base, California	July 26, 1984
Bureau of Land Management Riverside, California	August 1, 1984

As a result of the scoping meetings, numerous routing alternatives were identified in response to public and agency comments. Comments on all routes are discussed in the next section, and meeting summaries are included in Appendix I-A.

Comments from Nevada meetings indicated that the route paralleling the existing transmission lines from the McCullough area to the state line was an acceptable route, and no alternatives were suggested. However, comments from the California meetings indicated that alternatives to the I-15 Corridor should be identified for the California portion of the route. A number of scoping meeting participants in California expressed a preference for the proposed line to parallel the existing Boulder Transmission Line corridor between the McCullough and Barstow areas.

Task 5 - Select Study Corridors

Preliminary study corridors were selected, based on the environmental data base developed from previous studies for the area between McCullough and Victorville, the new data developed from the subregional siting studies, and public and agency input. These study corridors are shown on Figure I-9. Within the selected study corridors, a field review was conducted to identify study route centerline locations and potential access requirements.

Task 6 - Develop Scope/Preparation Plan

A Scope/Preparation Plan was developed for the environmental document. This plan considered the following:

- Previous studies, reports, EISs, and the CDCA Plan.
- Issues and alternatives resulting from the Subregional Siting Studies.
- Input from the agency/public scoping meetings, and the response to the NOA.
- Federal (NEPA) and state (California and Nevada) environmental reporting and compliance requirements.

The Work Program for Preparation of the Draft Environmental Report was completed in October 1984 (Dames & Moore 1984).

Task 7 - Publish Notices Required by CEQA and NEPA

Based on the review of data collected during Tasks 1-6, and on continuing discussions with agencies, it was determined that the proposed project would require the preparation of an EIS rather than an EA, to fulfill Federal requirements. Therefore, notices were published regarding BLM's and DWP's intent to prepare a joint EIR/EIS for the proposed project. The joint document is referred to as an ER.

As required by CEQA, a Notice of Preparation of the Draft ER was prepared on November 14, 1984 and sent to 29 "responsible and trustee agencies," and to another 130 interested or affected agencies, organizations and individuals. In response to this notice, 25 written comments were received and are summarized in Appendix 1-A.

As required by NEPA, a Notice of Intent to Prepare an EIS was published in the Federal Register on December 13, 1984 (49 FR 48621). One comment was received in response to this notice, and is summarized in Appendix 1-A.

CORRIDOR STUDIES AND ROUTE SELECTION

Introduction

Route selection was based on the identification and comparison of routing alternatives between the Mead/McCullough area and the Victorville/Adelanto area. Three steps were conducted in this process: (1) identification of initial routing alternatives, (2) comparison of those initial alternatives, and (3) selection of final routing alternatives. These steps are described below. From the five final routing alternatives identified in Step 3, the BLM and DWP selected their respective preferred routes.

Identification of Initial Routing Alternatives

Initial routing alternatives were identified through the scoping process and a field review. Subsequently, detailed environmental studies were conducted to form the basis of comparing those initial alternatives.

Scoping Process

As discussed previously, a substantial effort was expended in scoping the environmental studies undertaken for the proposed project, a major portion of which was directed towards identifying alternative corridors (subsequently, routes) to be assessed in the detailed corridor studies. Study corridors were

selected between Mead/McCullough and the Barstow area by using the extensive data base developed previously through the CDCA Plan, the Allen-Warner Valley and the IPP environmental studies, and agency/public input. Alternative study corridors between the Barstow area and Victorville/Adelanto terminals were selected based on previous studies, the Subregional Siting Study, and agency/public input.

One major siting alternative identified during agency/public contacts was to follow existing transmission lines through the Lucerne Valley area to the Mojave Power Plant and the Eldorado Substation (located near McCullough). Based on agency review with both BLM and Clark County's Comprehensive Planning Department, the route was eliminated because of longer distance and potentially greater impacts. The subregional siting study specifically evaluated potential alternatives parallel to the existing SCE lines through the Lucerne Valley (e.g., Eldorado-Lugo 500kV, Pisgah-Lugo 220kV, and Mojave-Lugo 500kV), and alternatives south and west of Victorville-Adelanto (e.g., Lugo-Vincent 500kV, and Victorville-Lugo 500kV). Results of this analysis indicated that numerous land use/visual conflicts would potentially result along these corridors, especially between Lugo and Adelanto/Victorville. Based on this information, these alternatives were eliminated from further consideration.

Field Review

Through a joint effort involving DWP, Dames & Moore and the BLM, alternative corridors were carefully reviewed through numerous field and aerial surveys. The objective of the review was to further refine the routing alternatives, delineate assumed centerlines for assessment studies, and to assure BLM of adequate space for placement of another major transmission line. In addition, access road requirements, including amount of potential disturbance (e.g., constructing new roads or upgrading existing roads), were major considerations during field review. Figure 1-10 shows the alternative corridors, which are delineated as numbered "links" for ease in comparing routing alternatives.

As a result of the field review and public scoping, alternatives north of Calico Mountains (e.g., Links 20, 37, 38, 39, 40, etc.) were identified. These alternatives avoid potential impacts associated with crossing the Mojave River Valley, are primarily within the BLM's contingency corridor (Corridor Q, as identified in the CDCA Plan) and, to a large degree, parallel existing transmission lines.

Inventory of Final Alternative Corridors

Following the review of existing data, completion of the subregional siting studies, field review of alternatives, and agency/public comment[1], approximately 575 miles of alternative corridors were studied in detail. The environment was inventoried for 10 resource categories to establish current environmental conditions. This baseline was then used to determine where and to what extent impacts from the project may occur. The resource categories inventoried were:

Natural Environment

Air Quality and Meteorology: Air quality, climate.

Earth Resources: Geology and seismicity, hydrology, water quality, soils, paleontology.

Biological Resources: Terrestrial vegetation, wildlife, rare, threatened and endangered plant and wildlife species.

Floodplains and Wetlands: One-hundred-year floodplains, wetlands, and associated vegetation.

Human Environment

Land Use: Land jurisdiction; existing and future uses; park, recreation and preservation areas.

Visual Resources: Scenic quality, visual sensitivity, visual resource management classes.

Socioeconomics: Demography, economy, employment, tax jurisdictions, community resources.

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[1]Following the identification of initial routing alternatives, DWP conducted a series of public and agency meetings to present, discuss and refine those alternatives. Public meetings were held as follows: Boulder City, March 4, 1985; Adelanto, March 7, 1985; Baker, March 12, 1985; and Silver Lakes, March 13, 1985. Appendix I-A contains a summary of the comments and discussions from these meetings.

Cultural Environment

Archaeology: Known and expected/probable resources.

History: Historic sites, trails, structures.

Ethnology: Native American religious and ritual sites, and hunting and gathering sites.

Project study areas along each corridor were established. The study area varied in width from one to six miles depending on the specific resource and types of impacts to be evaluated. Environmental data were compiled from existing literature, field reconnaissance, and agency contacts, and were mapped at a scale of 1/2 inch equals 1 mile (1:126,720). This inventory provided the basis for identifying and assessing specific impacts, and comparing routing alternatives. In addition, electrical, biological, health and safety effects were evaluated. In response to public scoping meetings, additional studies were also conducted on potential interference with George Air Force Base instrument landing equipment, and radio (RI) and television interference (TVI) in the Baker area.

Ground electrode and communication sites were not evaluated during the environmental studies since only upgrading of existing facilities or use of existing sites is anticipated. Existing terminal facilities will be used at Mead, McCullough and Victorville, so these sites were not addressed in the environmental studies. Because of the proposed expansion of the Adelanto Converter Station, this terminal location was addressed in the studies.

Additional environmental studies on alternatives around Coyote Lake (Link 44) and the development at Stateline (Link 45) were completed in March 1985. The new alternative at Stateline was identified during the public information meetings held in March at Boulder City, Nevada in order to avoid the potential private development in the area. Based on a series of agency contacts with the military, George Air Force Base found the alternative through Coyote Lake (Link 20) between the existing transmission lines (Boulder Corridor) and Fort Irwin Road unacceptable because of low-level training routes. The Air Force recommended moving the alignment further south and adjacent to the foothills of the Calico Mountains as mitigation that would be acceptable to their operations. Based on this input, Link 44, a route acceptable to the Air Force, was located in the foothills of the Calico Mountains between the Boulder Corridor and Fort Irwin Road.

Impact Assessment and Mitigation Planning

Environmental consequences from the proposed action and alternatives are the residual impacts remaining after mitigating measures have been applied to initial (unmitigated) impacts. The process involved assessing impacts based upon a comparison of the proposed project with the pre-project environment, determining mitigation that would effectively reduce or eliminate impacts and

identifying "residual" impacts, or impacts remaining after the application of committed mitigation. The impact assessment and mitigation planning process is briefly described below.

The initial step in the impact assessment/mitigation planning process was to define the proposed action, which collectively involved three components which are interrelated: (1) the project description, (2) access requirements, and (3) generic mitigation.

The first component described the Project Sponsors' proposed project design features, construction techniques, operational characteristics, and maintenance and abandonment procedures. The second component involved data on where and to what extent roads would have to be built or upgraded to construct and maintain the proposed project facilities for each routing alternative. The Project Sponsors provided information on where existing access was sufficient, where existing roads would require upgrading, and where new access roads would have to be constructed (Table 1-2). The third component was generic mitigation. Mitigation for the proposed project included two types of programs: generic and selective. Generic mitigation consists of measures or techniques to which the Project Sponsors made commitment on a "generic" or nonspecific basis as part of their proposed project plan. This level of mitigation was assumed in assessing impacts resulting from the proposed action. Generic mitigating measures are listed in Table 1-6. Selective mitigation consisted of measures or techniques to which the Project Sponsors made commitment on a case-by-case (or "selective") basis after impacts were identified and assessed.

The proposed action was thus defined as including the project description, road access requirements, and generic mitigation. The next set of data used in the impact assessment/mitigation planning process was the inventory of the pre-project environmental setting. Collectively, these data define the natural, human and cultural environments potentially affected by the proposed action.

Types of impacts were first identified by considering what effects project activities could have on the pre-project environment of each alternative route. Impact zones within alternative study corridors were defined as one-half-mile wide, and were delineated from a preliminary centerline, assuming that the final right-of-way would lie within the half-mile zone. Following identification of types of impacts, potential impacts were determined, assessed and documented according to location, type, and intensity of impact. The impact location was recorded by link number and milepost and the impacted area described. The impact type was recorded to correspond to the predetermined list of significant impact types relevant to each resource. The impact intensity was assessed and recorded both quantitatively and qualitatively. In order to determine impact levels, an "impact model" was developed for each resource classification. Each model was constructed from the same criteria:

- Resource Sensitivity, or the probable response of a particular resource to project-related activities.

- Resource Quality, or the pre-project condition of the resource potentially affected.

- Resource Quantity, or the amount of the resource potentially affected.

- Duration of Impact, or the period of time over which the resource would be affected, measured as short-term (up to a few years) or long-term (life of the project and beyond).

Although the underlying criteria were conceptually the same for each model, characteristics of the criteria varied according to the characteristics of each resource. Application of the models to each route yielded qualitative levels of high, moderate, low or no identifiable impacts, as defined below.

High Impact - A high level of impact would result if the construction, operation, maintenance or abandonment of the proposed project would potentially cause a significant or substantial adverse change or stress to an environmental resource(s).

Moderate Impact - A moderate impact would result if the construction, operation, maintenance or abandonment of the proposed project would potentially cause some adverse change or stress (ranging between significant and insignificant) to an environmental resource(s).

Low Impact - A low impact would result if the construction, operation, maintenance or abandonment of the proposed project would potentially cause an insignificant or small adverse change or stress to an environmental resource(s).

No Identifiable Impact - No identifiable impact would be indicated where no measurable impact would occur to the specific resource(s) under investigation.

In some cases where impacts were low, or mitigation would not be effective, no mitigation was recommended. Where mitigation was warranted and would be effective, mitigation recommendations were made by the resource specialists to reduce or eliminate specific impacts. To clarify the potential effectiveness of mitigation, quantitative values were assigned to qualitative impact levels during the mitigation planning process. This quantification procedure is described in Appendix I-B.

Based upon application of recommended mitigation, impacts were re-assessed and, where appropriate, impact levels reestablished. The preliminary residual impacts remaining after application of recommended mitigation indicated the effectiveness of a particular mitigation measure. The Project Sponsors evaluated the cost and technical feasibility of each recommended mitigation measure, and made commitment to undertake specific mitigation in specific geographic locales on a case-by-case basis. This selectively committed mitigation plan, along with the generic mitigation committed to as part of the project plan, constitute the mitigation program for the proposed project.

Selective mitigation measures are shown in Table 1-7. The location of each recommended selective mitigation measure is shown on Table 1-8 at the end of this chapter. The location of committed mitigation for the preferred transmission line route is shown in Table 5-2 (Map Volume). Subsequent assessment of the impacts remaining after selectively committed mitigation resulted in the final residual impacts that constitute the environmental consequences of the proposed action. Detailed impact assessment information (e.g., impact types, initial and residual impacts, and recommended and committed mitigation) is provided in the subsequent chapters of this report by resource and by milepost for each link.

Specific mitigation recommendations/commitments for cultural resources will be made following the completion of the committed pre-construction cultural resources studies. Mitigation will be developed in consultation with the SHPOs in California and Nevada and the ACHP as appropriate.

Comparison of Routing Alternatives

In order to assist BLM and DWP in selecting routing preferences, the environmental consequences for each route were summarized based on the individual impact (residual) assessment results, specific environmental resource preferences, and agency/public comments.

To facilitate description of the routing alternatives, the overall routing network was organized into subdivisions representing localized routing options. Six subdivisions of routing options, or "groups," were identified and represent major routing issues and decision points. These groups are:

A. Stateline Alternatives
B. I-15 Alternatives
C. Mojave Valley Alternatives
D. Kramer Junction Alternatives
E. Helendale-Victorville/Adelanto Alternatives
F. Fort Irwin Alternatives

Within each group, a combination of contiguous links constitutes an "option" that shares common beginning and end points with other options in the same set. The options within the six groups were then compared and the most favorable option within each of those groups identified. Selected options were then combined with their appropriate connectors to create five final routing alternatives from northern to southern terminals, from which the BLM Preferred and Project Sponsors' Preferred routes were identified. The preliminary options compared are listed in Table 1-9, and compared on Table 3-8 (in Map Volume). The following section summarizes various issues for each option compared and describes the preferences for the resources evaluated.

A. Stateline Alternatives

Links 0 and 1 are common to all three routing options and follow existing transmission lines their entire distance, crossing the McCullough Mountains (bighorn sheep habitat), routing south of Jean Lake, with overall low impacts identified. Virtually no differences exist for biological, land use, and visual resources (residential, recreation and highways) associated with Routing Options A-1 and A-2. While Option A-2 follows the existing Boulder Corridor, Option A-1 follows the newly constructed IPP transmission line through Roach Lake. Routing Option A-3 is utilized for comparing the I-15 alternatives.

No significant concerns or routing preferences were identified at the public meetings. The BLM in Nevada expressed concern for recreational uses associated with dry lake beds in the area.

B. I-15 Alternatives

Routing Options B-2 and B-21 both utilize Link 8 and were preferred over Options B-1 and B-20 which utilize Link 7. Greater potential visual (scenic quality), archaeological (new access requirements) and biological (desert tortoise) impacts were found along Link 7 because of no existing roads or transmission lines located in this alignment. Routing Option B-2 is the most preferred because it follows the existing corridor. Although Routing Option B-21 avoids private lands, Option B-2 parallels the existing line, crossing lands that lack any future development plans (none were filed with the county). Option B-2 appears environmentally preferred while Option B-21 would be the Project Sponsors' Preferred Route.

Option B-3 is environmentally preferred while Option B-4 is the Project Sponsors' preferred option. Option B-4 crosses the East Mojave National Scenic Area which lies within approximately one mile of I-15 (I-15 is crossed twice) and would be highly visible. Option B-3 would generally follow an existing transmission line (existing 138kV line is considerably smaller than the proposed action) for the majority of its length. Option B-3 would place the line immediately adjacent to the north edge of Baker, whereas Option B-4 would be separated from Baker by I-15.

Option B-6 is preferred environmentally and would be the Project Sponsors Preferred Route in this area. This alignment would generally follow the existing 138kV transmission line. Routing Option B-5 crosses a portion of the East Mojave National Scenic Area and the environmentally sensitive Soda Mountains.

Option B-7 was environmentally more acceptable than Options B-8 and B-9 since they cross/parallel the Mojave River and traverse Cave Mountain (BLM Afton Canyon Recreation Area, bighorn sheep habitat, and high scenic quality). Option B-7 parallels an existing transmission line and avoids the recreation area and associated impacts. Option B-10 was preferred environmentally and by the Project Sponsors over Option B-11.

The results of the public workshop and scoping meetings held in Baker indicated that Baker residents, East Mojave National Scenic Area supporters, and other agency representatives all strongly favor the Boulder Corridor over any of the I-15 alternatives. Concerns were for visual impact, future land use impacts, and RI/TVI to area residents and I-15 travelers.

C. Mojave Valley Alternatives

Routing Option C-2 was environmentally preferred over Option C-3 because it would parallel the existing Boulder Corridor (four extra high voltage lines), while C-3 would only parallel a small existing line. Greater visual (highway and residential) and historical impacts are anticipated along Option C-3. Option C-2 may potentially result in removal of two residences if routed south and adjacent to the existing corridor. Option C-2 is also the BLM Preferred Route.

Option C-4 is the Project Sponsors' Preferred Route and was identified as a mitigation (to Routing Option C-1) measure to avoid potential impacts to the low-level training flights occurring over Coyote Lake. If Option C-4 is utilized, the proposed transmission line would be located within 0.25 mile north of the existing transmission line (along Link 21a), thus avoiding removal of two residences, and increasing system reliability. Option C-1 was identified as unacceptable by the George Air Force Base.

D. Kramer Junction Alternatives

Routing Option D-5 follows existing transmission lines and is located within the BLM's contingency corridors (P and Q, CDCA Plan 1980) for its entire distance. Link 42 of Option D-3 (Project Sponsors' Preferred Route) and Link 37 of Option D-4 deviated from existing transmission lines and the identified contingency corridors. Based on agency/public input, Kramer Junction routing options are all more preferable than any of the Helendale alternatives.

E. Helendale-Victorville/Adelanto Alternatives

Of the Helendale alternatives, Routing Option E-6 parallel to the IPP transmission line is the environmentally more acceptable route. Although Option E-8 generally follows the Boulder Corridor, it veers away close to Victorville, resulting in greater biological/visual impacts than Option E-6. Although very similar, Option E-1 is slightly better than E-2 (both utilize Link 24a), while Option E-3 is more preferred than E-4 (both utilize Link 27) because Options E-1 and E-3 parallel the existing corridor for a greater distance. Routing Option E-6 is environmentally more acceptable than either E-1 or E-3 because it parallels an existing corridor for a greater distance. Significant visual (Mojave River and surrounding residential areas) and biological (highest desert tortoise density area) impacts are anticipated along

Options E-1 and E-3. Routing Option E-6 however would remove one residence.

Routing Options E-1, E-3 and E-6 were identified as unacceptable during the public workshops held in Adelanto and Silver Lakes. Concerns noted included the crossing of the Mojave River, land use (both existing and future), and visual impacts to residents. In addition, the City of Victorville is opposed to any alternatives through the city (e.g., Routing Option E-6).

F. Fort Irwin Alternatives

No major impacts were identified along Link 6 of the Fort Irwin alternatives. Alternatives following the Boulder Corridor were preferred by residents of Baker, East Mojave National Scenic Area supporters, and CALTRANS personnel.

Final Routing Alternatives

Following the comparison of the numerous routing options associated with the six major comparison sets, final routing alternatives for two major geographic areas were identified: (1) between Mead/McCullough and Barstow, and (2) from Barstow to Victorville/Adelanto.

First, the Project Sponsors' Preferred Route (Links 5a, 45, 5c, 8, 10, 12, 13, 14, 15, 18 and 19) and the environmentally best I-15 alternative (Links 5a, 5b, 5c, 8, 9, 13, 16, 18 and 19) were both compared with the Boulder Corridor (Link 6). While only minimal environmental impacts were found along the Boulder Corridor (Fort Irwin alternative), significant visual, biological, cultural, recreational and RI/TVI impacts were identified along both of the I-15 Corridor alternatives. As a result of this comparison, any alternative along the I-15 Corridor would be substantially worse (environmentally) than the Boulder Corridor. Therefore, the comparison charts for the final routing alternatives only compare the Boulder Corridor with one I-15 route--the Project Sponsors' Preferred Route.

Second, the environmentally best alternatives, one around Kramer Junction (Links 21a, 20b, 41, 38, 39, 40a, 40b, 30 and 31) and the Boulder Corridor (Links 21a, 21b, 23, 25, 26, 32 and 35) through Victorville were identified. Although paralleling existing lines from Barstow south, the Boulder Corridor alternative crosses over a mile of irrigated cropland, crosses the Mojave River twice, and crosses important historic resources, although visual impacts are minimal. The Kramer Junction alternative is located in a BLM contingency corridor and would require upgraded or new access for approximately 30 miles, resulting in potential impacts to biological, visual and archaeological resources. The Boulder Corridor alternative would potentially remove three residences, two residences along the south side of Link 21a and one along Link 35. No residences would be removed if the Kramer Junction alternative

is utilized because DWP would build on the north side of the Boulder Corridor (along Link 21a), thus avoiding all residences.

The Project Sponsors' Preferred Route around Kramer Junction was also included as a final routing alternative.

The five final routing alternatives evaluated, as shown on Figure 3-8 (Map Volume) and Figure 1-11 at the end of this chapter, are compared on Table 3-9 (Map Volume). These alternatives are as follows:

ALTERNATIVE A (BLM Preferred Route)
Segments: A-1 (Links 0, 1, 3)
F-2 (Links 6, 21a, 21b)
F-4 (Link 23)
E-6 (Links 25, 26, 32, 35)

ALTERNATIVE B (Contingency Corridor)
Segments: A-2 (Links 0, 1, 2, 4)
F-1 (Link 6)
C-5 (Links 21a, 44, 20b)
D-5 (Links 41, 38, 39, 40a)
D-7 (Links 40b, 30, 31)

ALTERNATIVE C
Segments: A-1 (Links 0, 1, 3)
F-1 (Link 6)
C-5 (Links 21a, 44, 20b)
D-3 (Links 42, 40a)
D-7 (Links 40b, 30, 31)

ALTERNATIVE D (Project Sponsors' Preferred Route)
Segments: A-3 (Links 0, 1, 2)
B-21 (Links 5a, 45, 5c, 8)
B-16 (Links 10, 12, 13, 14, 15, 18)
C-4 (Links 19, 21a, 44, 20b)
D-3 (Links 42, 40a)
D-7 (Links 40b, 30, 31)

ALTERNATIVE E
Segments: A-3 (Links 0, 1, 2)
B-21 (Links 5a, 45, 5c, 8)
B-16 (Links 10, 12, 13, 14, 15, 18)
C-4 (Links 19, 21a, 44, 20b)
D-5 (Links 41, 38, 39, 40a)
D-7 (Links 40b, 30 31)

Alternative A (BLM Preferred Route)

Alternative A is the shortest alternative (183.0 miles) and would cross the least amount of private land (33.5 miles) and the most miles (4.4) of incorporated lands. With the exception of 0.6 mile of new access, the remaining 182.4 miles would utilize existing access roads (assuming 200-foot separation from existing lines). Only the Boulder Corridor alternative would cross the Mojave River (twice) and affect the least miles of special (protected) interest plant species habitat, and Gila monster and Mohave ground squirrel habitat. While Alternative A follows the designated BLM Boulder Corridor for approximately 100 miles, three residences would potentially be removed. The Boulder Corridor also crosses the most miles of high archaeological sensitivity and major areas of historical sensitivity.

Of the final routing alternatives, Alternative A is more preferred than an I-15 alternative. Alternative A through Victorville is least preferred by area residents, the City of Victorville, and George Air Force Base.

Alternative B (Contingency Corridor)

Alternative B is 212.8 miles long and crosses the largest amount of public lands (162.4 miles). Approximately 34 miles of new or upgraded access roads would be required. This alignment would cross 56.5 miles of moderate to high density desert tortoise habitat. The corridor would follow existing lines for a total of approximately 180 miles, while the entire alignment is located within the designated Boulder Corridor (77.8 miles) or contingency corridors P and Q (85.2 miles) as described by the BLM CDCA Plan. The alignment crosses the least miles of VRM Class II, BLM East Mojave National Scenic Area, and California Natural Areas. Only two California state highways eligible for scenic designation are crossed.

Based on the results of the agency/public scoping and workshop meetings held during the environmental studies, Alternative B would be acceptable to the public (area residents in Baker, Victorville, Adelanto and Silver Lakes), agencies (City of Victorville, George and Edwards Air Force Bases, and CALTRANS), and public interest groups (e.g., supporters of the East Mojave National Scenic Area).

Alternative C

Alternative C is approximately 10 miles shorter than Alternative B and would have similar environmental impacts. The only significant difference is that Alternative C utilizes Link 42, past Kramer Junction, which does not follow a BLM contingency corridor or existing transmission lines. An existing access road is paralleled for 27.5 miles along Link 42. A total of 56 miles of new or upgraded access roads are potentially required.

This route is also more preferable to the public than Alternatives A, D and E because it would parallel the Boulder Corridor past Baker and avoid the Victorville/Helendale areas by going north around Calico Mountains.

Alternative D (Project Sponsors' Preferred Route)

The Project Sponsors' Preferred Route parallels the existing Boulder Transmission Lines from Mead to McCullough. The route then parallels the IPP transmission line west of McCullough, parallels I-15 within BLM's designated Utility Corridor BB (CDCA Plan 1980), rejoins the existing Boulder Transmission Lines for several miles northeast of Barstow, and goes north of Barstow and the Calico Mountains within BLM's CDCA contingency corridors. The route then generally parallels portions of SCE's Coolwater to Kramer and Kramer to Lugo transmission lines to Adelanto.

This alternative is 205.5 miles long, crossing 152.4 miles of public land and 48.9 miles of private land, with a total of 116.6 miles of new or upgraded access being required. Approximately 74 miles of the Project Sponsors' Preferred Route crosses moderate to high density desert tortoise habitat. The alignment follows 66.1 miles of BLM designated corridors and parallels approximately 100 miles of existing transmission lines. The proposed alignment affects the greatest amount of VRM Class II areas (44.5 miles), BLM East Mojave National Scenic Area (29.4 miles), and California Natural Areas (19.6 miles). The Project Sponsors' proposed action crosses the least amount of archaeologically sensitive areas.

Concern has been expressed by area residents (Baker), special-interest groups (supporters of the East Mojave National Scenic Area), and agencies (CALTRANS). No public concern has been expressed for the Kramer Junction portion of this alternative.

Alternative E

Alternative E is the same as the Project Sponsors' Preferred Route except that the route would follow Links 41, 38 and 39 (BLM contingency corridor and existing transmission line) around Kramer Junction. This alternative would cross the greatest amount of private land (54.6 miles), high erosion potential soils, special-interest plants (82.4 miles), moderate to high density desert tortoise habitat (83.3 miles), East Mojave National Scenic Area (29.4 miles), and California Natural Areas (19.6 miles).

Alternative E has the same agency/public concerns as expressed in Alternative D.

Environmentally Superior Route

The "environmentally superior alternative" (as required by CEQA to be identified) has been determined to be the BLM Preferred Route for the area between Mead and the vicinity of Coyote Lake. From there to Adelanto, both the BLM and Project Sponsors' Preferred Routes are equal in environmental suitability. Although the types of affected resources are different along these routes, the overall impact is approximately equal.

TABLES

TABLE 1-1
TRANSMISSION LINE CONSTRUCTION
Personnel and Equipment Required

Road Construction - 7 people
(including maintenance)

equipment:
- 2 bulldozers (D-6 or D-8)
- 2 motor graders
- 2 pickup trucks
- 2 water trucks (for construction and maintenance)

Footing Installation - 13 people

equipment:
- 2 hole diggers
- 1 bulldozer (D-6)
- 1 truck (2 ton)
- 6 concrete trucks
- 6 hydro crane (15 ton)
- 2 pickup trucks
- 2 carry alls
- 1 batch plant
- 2 dump trucks
- 2 wagon drills

Structure Steel Haul - 9 people

equipment:
- 6 steel haul trucks
- 1 yard crane (heavy duty)
- 2 pickup trucks

Structure Assembly - 25 people

equipment:
- 4 carry alls
- 4 pickup trucks
- 4 cranes (rubber tired)
- 4 trucks (2 ton)

Structure Erection - 10 people

equipment:
- 2 cranes (60 ton)
- 2 pickup trucks
- 2 trucks (2 ton)

TABLE I-1
TRANSMISSION LINE CONSTRUCTION
Personnel and Equipment Required

Road Construction - 7 people
(including maintenance)

equipment: 2 bulldozers (D-6 or D-8)
2 motor graders
2 pickup trucks
2 water trucks (for construction and maintenance)

Footing Installation - 13 people

equipment: 2 hole diggers
1 bulldozer (D-8)
1 truck (2 ton)
6 concrete trucks
6 hydro crane (15 ton)
2 pickup trucks
2 carry alls
1 batch plant
2 dump trucks
2 wagon drills

Structure Steel Haul - 7 people

equipment: 6 steel haul trucks
1 yard crane (heavy duty)
2 pickup trucks

Structure Assembly - 25 people

equipment: 4 carry alls
4 pickup trucks
4 cranes (rubber tired)
4 trucks (2 ton)

Structure Erection - 10 people

equipment: 2 cranes (50 ton)
2 pickup trucks
2 trucks (2 ton)

Table 1-1 (continued)
Transmission Line Construction

Conductoring - 40 people

equipment:
- 1 helicopter and fly ropes
- 3 drum pullers (1 light, 1 medium, 1 heavy)
- 2 splicing trucks
- 2 double-wheeled tensioners (1 light, 1 heavy)
- 6 wire reel trailers
- 2 diesel tractors
- 1 crane (2-4 ton)
- 1 sagging equipment
- 4 trucks (5 ton)
- 6 pickup trucks

Clean-up - 12 people

equipment:
- 2 pickup trucks
- 2 trucks (2 ton)

Road to Bed - 4 people

equipment:
- 1 bulldozer (D-8)
- 2 motor graders
- 1 pickup truck

TOTAL PERSONNEL REQUIRED - 120

Source: Mead-Phoenix EIS
Victorville Rinaldi II EIR

Table 1-1 (continued)
Transmission Line Construction

Conductoring - 60 people

equipment: 1 helicopter and lily rigs
3 drum pullers (1 light, 1 medium, 1 heavy)
2 soloing trucks
2 double-wheeled tensioners (1 light, 1 heavy)
6 wire reel trailers
2 diesel tractors
1 crane (2-4 ton)
1 stapling equipment
6 trucks (5 ton)
6 pickup trucks

Cleanup - 12 people

equipment: 2 pickup trucks
2 trucks (2 ton)

Road to Bed - 4 people

equipment: 1 bulldozer (D-8)
2 motor graders
1 pickup truck

TOTAL PERSONNEL REQUIRED - 120

Source: Mead-Phoenix EIS
Victorville-Rinaldi II EIR

TABLE 1-2
ESTIMATED ACCESS REQUIREMENTS

Link Number	Length (Mileage)	Sufficient (Mileposts)	Upgrade (Mileposts)	New (Mileposts)
0	13.5	0.0-13.5	-	-
1	16.6	0.0-16.6	-	-
2	6.5	0.0- 6.5	-	-
3	8.4	0.0- 8.4	-	-
4	1.9	0.0- 1.9	-	-
5a	0.2	0.0- 0.2	-	-
5b	4.8	0.0- 4.8	-	-
5c	12.3	0.0- 7.3	-	7.3- 9.0
		9.0-12.3	-	-
6	83.3	0.0-83.3	-	-
7	13.5	-	-	0.0-13.5
8	12.9	0.0-12.9	-	-
9	25.0	6.0-25.0	0.0- 6.0	-
10	19.9	-	9.0-19.9	0.0- 9.0
11	20.5	-	-	0.0-20.5
12	4.9	-	-	0.0- 4.9
13	10.6	0.0- 7.0	7.0-10.6	-
14	4.9	-	-	0.0- 4.9
15	5.0	-	-	0.0- 5.0
16	8.6	-	0.0- 8.6	-
17	5.3	-	-	0.0- 5.3
18	3.7	-	0.0- 3.7	-
19	7.9	-	-	0.0- 7.9
20a	21.0	-	14.4-21.0	0.0-14.4
20b	17.9	9.0-17.9	0.0- 2.7	2.7- 7.8
		-	7.8- 9.0	-
21a	6.0	0.0- 6.0	-	-
21b	8.0	0.0- 8.0	-	-

Table 1-2 (continued)
Estimated Access Requirements

Link Number	Length (Mileage)	Sufficient (Mileposts)	Upgrade (Mileposts)	New (Mileposts)
22	21.1	-	0.0-21.1	-
23	13.8	0.0-13.8	-	-
24a	27.3	-	-	0.0-27.3
24b	6.1	-	-	0.0- 6.1
25	11.7	0.0-11.7	-	-
26	0.6	-	-	0.0- 0.6
27	13.4	-	10.0-13.4	0.0-10.0
28	3.2	-	-	0.0- 3.2
29	2.1	-	-	0.0- 2.1
30	2.1	0.0- 2.1	-	-
31	5.7	0.0- 5.7	-	-
32	16.4	0.0-16.4	-	-
33	15.5	0.0- 6.5	-	6.5-11.0
		11.0-15.5	-	-
34	1.4	0.0- 1.4	-	-
35	4.7	0.0- 4.7	-	-
36	5.8	-	2.5- 4.3	0.0- 2.5
		-		4.3- 5.8
37	7.3	-	-	0.0- 7.3
38	10.3	0.0-10.3	-	-
39	6.2	0.0- 6.2	-	-
40a	6.2	0.0- 6.2	-	-
40b	4.9	0.0- 4.9	-	-
41	15.5	0.0-15.5	-	-
42	21.9	-	2.4-21.9	0.0- 2.4
43	3.9	-	-	0.0- 3.9
44	16.2	-	0.0- 3.4	3.4-16.2
45	5.7	-	-	0.0- 5.7

TABLE 1-3
PROPOSED CONSTRUCTION SCHEDULE

	Begin Land Acquisition	Procure Major Equipment	Begin Construction	Operation
500kV Transmission Line	7/87	9/87	1/89	1/91
DC Terminals	7/87	10/87	1/89	1/91
AC Switchyards	7/87	10/87	1/89	1/91
Ground Electrode Sites	7/87	10/87	1/89	1/91

Communication Facilities: Various schedules for separate facilities. In-service date estimated to be July 1990.

Surveying: Survey Control will begin July 1986.

TABLE 1-4
SUMMARY OF ESTIMATED CAPITAL COSTS
(1984 Dollars)

Description	DC Cost ($ X 1000)	AC Cost ($ X 1000)
500kV Transmission Line*	$ 130,000	$ 120,000
Mead Terminal	--	--
Adelanto Terminal	175,000	--
AC Switchyards	35,000	35,000
Development Works (nonconstruction)	10,000	10,000
TOTAL	$ 350,000	$ 165,000

*Includes right-of-way, communication facilities, and, for a DC transmission line, the ground electrode/neutral return system.

Costs are escalated at 7 percent per year.

Source: DWP

TABLE 1-5
REGIONAL-SCALE ENVIRONMENTAL DATA COLLECTED

Land Use/Visual Resources

1. Existing and proposed major linear rights-of-way, transmission lines, pipelines, canals, railroads and roads.
2. Cultivated croplands.
3. Military reservations and facilities.
4. Airports, major airstrips, and sensitive communication equipment.
5. Existing and planned communities and large residential developments.
6. Existing BLM Visual Resource Management (VRM) Classes I and II.
7. Established, designated or planned recreation, preservation, education or scientific areas.
   - National Natural Landmarks
   - National Wilderness or Primitive Areas
     - Designated
     - Study Area
   - Areas of Critical Environmental Concern
   - Natural Areas
   - Other Major Non-Urban Parks
   - Officially Designated Scenic Highways or Parkways
8. Official goals, policies or plans related to transmission line corridors.

Biological Resources

1. Federally classified "critical habitats" or habitats of threatened or endangered species.
2. Habitats of state-listed protected, threatened or unique species; other rare or undisturbed habitats.

Cultural Resources

1. Existing or proposed National or State Register archaeological or historical properties.
2. Known high-density historic or prehistoric site areas.
3. Areas known to be culturally important by tribal groups.

TABLE 1-6
GENERIC MITIGATION MEASURES

GENERIC MITIGATION

1. All construction vehicle movement outside the right-of-way will normally be restricted to predesignated access, contractor acquired access or public roads.

2. The areal limits of construction activities will normally be predetermined, with activity restricted to and confined within those limits. No paint or permanent discoloring agents will be applied to rocks or vegetation to indicate survey or construction activity limits.

3. In construction areas where recontouring is not required, vegetation will be left in place wherever possible and original contour will be maintained to avoid excessive root damage and allow for resprouting.

4. In construction areas where recontouring is required, revegetation and/or reseeding will occur as required by the landowner.

5. Watering facilities will be repaired or replaced if they are damaged or destroyed by construction activities.

6. Towers over 200 feet in height and conductors will be marked with high-visibility devices where required by governmental agencies (Federal Aviation Administration).

7. On agricultural land, right-of-way will be aligned, insofar as practical, to reduce the impact to farm operations and agricultural production.

8. Prior to construction, all supervisory construction personnel will be instructed on the protection of cultural and ecological resources. To assist in this effort, the construction contract will address: (a) Federal and state laws regarding antiquities and plants and wildlife, including collection and removal; (b) the importance of these resources and the purpose and necessity of protecting them.

9. Preconstruction Cultural Resource Studies

   Intensive cultural-resource surveys will be conducted on the preferred route by an appropriately qualified professional to identify specific properties subject to impact from the construction, operation and maintenance of the proposed project. The cultural resource surveys will include historical, ethnographic, architectural and archaeological elements.

TABLE 1-6
GENERIC MITIGATION MEASURES

GENERIC MITIGATION

1. All construction vehicle movement outside the right-of-way will normally be restricted to predesignated access, contractor acquired access or public roads.

2. The areal limits of construction activities will normally be predetermined, with activity restricted to and confined within those limits. The point of permanent discarding spoils will be applied to rocks or vegetation to indicate survey or construction activity limits.

3. In construction areas where reclamation is not required, vegetation will be left in place wherever possible and original contour will be maintained to avoid excessive root damage and allow for regrowth.

4. In construction areas where reclaiming is required, revegetation and/or reseeding will occur as required by the landowner.

5. Watering facilities will be repaired or replaced if they are damaged or destroyed by construction activities.

6. Towers over 200 feet in height and conductors will be marked with flight visibility devices where required by governmental agencies (Federal Aviation Administration).

7. On agricultural land, right-of-way will be aligned, insofar as practical, to reduce the impact to farm operations and agricultural production.

8. Prior to construction, all supervisory construction personnel will be instructed on the protection of cultural and ecological resources. To assist in this effort, the construction contract will address: (a) Federal and state laws regarding antiquities and plants and wildlife, including collection and removal; (b) the importance of these resources and the purpose and necessity of protecting them.

9. Preconstruction Cultural Resource Studies

Intensive cultural-resource surveys will be conducted on the preferred route by an appropriately qualified professional to identify specific properties subject to impact from the construction, operation and maintenance of the proposed project. The cultural resource surveys will include historical, ethnographic, architectural and archaeological elements.

Table 1-6 (continued)
Generic Mitigation Measures

A. The historical element will include, but not be limited to, development of the narrative history of the study area. The purpose of the narrative history will be to provide a framework in which to evaluate individual historic properties.

B. The ethnographic elements will include, but not be limited to, the identification of general and/or specific heritage or ethnic concerns. The purpose of the ethnographic study will be to provide a framework in which to evaluate the concerns of local Native Americans for historic and prehistoric properties in the study area and to assess the effect that the proposed action will have.

C. The architectural element of the cultural resource study will focus on, but may not be limited to, the identification of properties within the study area that may be of architectural importance.

D. The archaeological element will include, but will not be limited to, identification and evaluation of prehistoric archaeological resources, within the study area. The archaeological study will compile sufficient background information on the prehistory of the study area in order to assess and/or provide a framework in which to evaluate individual prehistoric properties.

E. An intensive archaeological survey will be conducted on the proposed right-of-way, access roads and any other areas that will be disturbed by the construction and/or operation of the proposed transmission line. The purpose of the survey will be to identify specific properties within the survey area that may have cultural resource values. The survey will be established in consultation with the State Historic Preservation Officer (SHPO) or his/her designated representative within each state.

F. Following identification of the cultural resources within the survey study area, a preliminary report(s) will be prepared and maps with site locations will be compiled. The preliminary report will include a brief description and evaluation of the cultural resources located within the survey study area and recommendations for avoidance. The preliminary report and maps will be submitted to the Project Sponsors' transmission line engineers. The site information will be used in siting towers, access roads and other construction areas to avoid, to the extent possible, the cultural resources along the route.

G. A report or separate section of a report(s) will be prepared for each element. Each report will include, but will not be limited to, a description of background research and evaluation of existing data, a description of field inspection methods, a substantive assessment of the

results of the survey, recommendations of testing or further analysis and an evaluation of the significance of each property.

H. A preservation plan will be prepared. The plan will address all four elements - archaeology, history, ethnology and architecture. The preservation plan will include, but not be limited to, the following: (a) identification of those cultural resource properties that are not considered to be eligible for the inclusion in the National Register of Historic Places and the rationale for such an evaluation, (b) identification of those cultural resource properties that are considered to be eligible for inclusion in the National Register of Historic Places and the rationale of such an evaluation, (c) a detailed description of the type and degree of impact the proposed project will have with regard to those properties identified above, (d) recommendations for mitigating any adverse effects that are expected to occur, (e) recommendations for general protective procedures to be followed during construction, maintenance and operation of the proposed transmission line.

I. BLM will follow the procedures prescribed in 36 CFR 800.4 and 36 CFR 63 and will consult with the SHPO and ACHP regarding determination of eligibility, determination of effect, and identification of measures which will avoid or mitigate any adverse effects.

J. Project Sponsors will satisfactorily avoid or mitigate the adverse effects to cultural resources resulting from the proposed project in accordance with measures agreed upon by the BLM, SHPO and ACHP.

10. The Project Sponsors will respond to complaints of line-generated radio or television interference by investigating the complaints and implementing appropriate mitigation measures.

11. The Project Sponsors will apply necessary mitigation to eliminate problems of induced currents and voltages onto conductive objects sharing a right-of-way, to the mutual satisfaction of the parties involved.

12. The Project Sponsors will continue to monitor studies performed to determine the effects of audible noise and electrostatic and electromagnetic fields in order to ascertain whether these effects are significant.

13. Roads would be built as near as possible at right angles to the streams and washes. Culverts would be installed where necessary. In addition, road construction would include dust-control measures during construction in sensitive areas. All existing roads would be left in a condition equal to or better than their condition prior to the construction of the transmission line.

Table 1-6 (continued)
Generic Mitigation Measures

14. All requirements of those entities having jurisdiction over air quality matters will be adhered to and any necessary permits for construction activities will be obtained. Open burning of construction trash will not be allowed unless permitted by appropriate authorities.

TABLE I-7
SELECTIVELY COMMITTED MITIGATION MEASURES

Note: These selective mitigation measures apply only to the specific locations indicated on Table 5-2 in the Map Volume.

SELECTIVE MITIGATION

Access Roads

1. No new access will be constructed in designated areas; e.g., construction and maintenance will be accomplished without benefit of new access in designated areas. This would minimize ground disturbance, limit new or improved accessibility. No helicopter construction or patrol is assumed.

2. No widening or upgrading of existing access roads will be undertaken (same benefits as 1 above).

3. The alignment of any new access roads will follow the designated area's landform contours, providing that such alignment does not additionally impact resource values. This would minimize ground disturbance and/or reduce scarring (visual contrast).

4. All access roads not required for maintenance will be permanently closed using the most effective and least environmentally damaging methods appropriate to that area with concurrence of the landowner. This would limit new or improved accessibility into the area.

Tower and Conductor Design

5. Special tower design may be utilized to minimize ground disturbance, operational conflicts, visual contrast and/or avian conflicts.

6. The finish on steel towers will be dulled in designated areas to reduce visual contrast.

7. In designated areas conductors will be constructed of nonspecular material to reduce visual contrast.

8. In designated areas structures will be placed so as to avoid sensitive features and/or to allow conductors to clearly span the features, within limits of standard tower design. This would minimize amount of sensitive feature disturbed and/or reduce visual contrast.

9. Standard structure spacing will be modified to correspond with spacing of existing transmission line structures where feasible and within limits of standard structure design. This would reduce visual contrast.

Table 1-7 (continued)
Selectively Committed Mitigation Measures

10. Line will be re-routed where feasible to clearly avoid unmitigable sensitive features. This would eliminate or severely reduce visual or physical conflict with feature.

Construction Schedule

11. In designated areas, if deemed appropriate by pre-construction surveys (see 13 below), construction activities will be modified during breeding or non-hibernation season of sensitive, listed or proposed threatened or endangered species. This would reduce disturbance to sensitive species.

    a. Construction activities in known desert bighorn sheep habitat would be limited to the summer and fall months when the sheep are restricted to their small, isolated crucial habitats away from potential disturbances from construction activities.

    b. Construction activities in potential desert tortoise habitat with high densities (150 to 250 individuals per square mile) or very high densities (greater than 250 individuals per square mile) would be restricted to the period of October to March when tortoises are underground and hibernating. Hence, construction activities and vehicular movements on the ground surface would not greatly disturb the tortoise and would eliminate the potential for mortality by vehicular collisions.

Preconstruction Study Programs

12. Prior to construction, a geotechnical field review of tower and access-road design will be conducted by a qualified professional to identify site-specific, soil-erosion impacts and determine the most effective means of mitigating them. For paleontological resources, a field review of tower and access road design and location will be conducted by a qualified professional to identify fossil localities that should not be disturbed. Possible mitigation measures could include minor adjustments in tower and road locations, restricting access during periods of high moisture, and utilizing selective biodegradable soil stabilizing agents, etc.

13. Prior to construction, an ecological field review of tower and access-road design will be conducted by a qualified professional to identify site-specific impacts to threatened, endangered or otherwise sensitive vegetation and wildlife and to determine the most effective means to mitigate those impacts. Possible mitigation measures could include minor adjustments in tower and road locations, closing access roads, relocating sensitive species, habitat improvements, etc.

    a. The presence of special-interest plants in areas likely to provide suitable habitat would be evaluated by seasonal surveys prior to

construction. Populations in potential disturbance zones would be identified and the locations of towers, construction yards, and new access roads would be altered to avoid the populations.

b. During construction activities in high and very high density desert tortoise habitats, a qualified biologist would be on-site to locate and mark any tortoise dens that would be adversely affected by construction activities.

TABLE 1-8
LOCATIONS OF SELECTIVELY RECOMMENDED MITIGATION MEASURES
Mead/McCullough-Victorville/Adelanto Transmission Project

Link Number	#1 No New Access		#2 No Widening of Existing Access		#3 Access to Follow Existing Contours		#4 Close Access Road		#5 Special Tower Design[a]		#6 Dull Tower Finish	#7 Non-Specular Conductors	#8 Modify Tower Placement			#9 Modify Tower Spacing	#10 Reroute Line	#11a #11b Curtail Construction		#12 Preconstruction Field Review		#13a #13b Preconstruction Field Review	
	Biology	Visual	Biology	Land Use	Visual	Land Use	Biology	Land Use	Visual	Land Use	Visual	Visual	Biology	Visual	Land Use	Visual	Land Use	Biology	Biology	Earth	Paleo	Biology	Biology
0			3.0- 3.1										3.0- 3.1		12.2-13.1								
1			5.2-16.6												5.6-14.5			6.7-11.2				5.2-11.2	
2			0.0- 2.0																				
3			0.0- 2.0																				
4																							
5a																							
5b											0.8- 4.8	0.8- 4.8				2.0- 4.6							
5c			1.0- 7.3 9.0-12.3	11.4-12.2	7.3- 8.9			8.8- 9.0			0.0- 2.3 5.4- 7.8 10.0-12.3	0.0- 2.3 5.4- 7.8 10.0-12.3	7.3-12.3		8.8-12.2			9.0-12.3				6.5-12.3	
6			1.8-18.0 31.0-38.0 45.5-47.2 53.0-60.0 64.0-82.0	8.9-20.3											8.9-20.3			10.0-13.0				8.5-18.0	
7					0.0-13.5	0.0- 6.7		0.0- 7.7			0.0-13.5	0.0-13.5			0.0- 7.7			0.0- 2.7	5.6-13.5	0.0- 7.4 9.6-12.1 13.3-13.5		0.0- 5.6	5.6-13.5
8			0.0-12.9	0.0- 6.8			0.0- 2.6				0.0- 9.8	0.0- 9.8			0.0- 8.5	6.2- 6.9		0.0- 2.6				0.0- 5.9	
9			11.5-25.0		0.0- 3.7					20.1-20.4	0.0-10.6 17.8-25.0	0.0-10.6 17.8-25.0	24.0-25.0	0.0- 3.7	2.5- 2.9 4.4- 5.3 20.0-20.1	0.0- 1.8 17.8-21.5				6.2-10.6			
10				9.0-19.9	0.0- 8.7	0.5- 9.0		0.5- 9.0			0.0-19.9	0.0-19.9			0.5-19.9				12.0-19.9	0.0- 0.3 7.8- 9.0			12.0-19.9
11		6.3- 8.5			1.4- 7.5 9.5-11.8 12.9-14.5	0.0- 6.3		0.0- 6.3			0.0-20.5	0.0-20.5	18.0-20.5		0.0- 6.9				0.0- 0.7	0.0- 6.8 9.1-12.5 13.2-16.3			0.0- 0.7
12	3.8- 4.9				0.0- 1.2	0.0- 2.4		0.0- 2.4			0.0- 4.9	0.0- 4.9	3.8- 4.9		0.0- 2.4				0.0- 1.0	0.0- 4.3			0.0- 1.0
13							1.8- 3.5				0.0-10.6	0.0-10.6	1.8- 3.5			7.5- 7.9							
14					0.0- 1.6						0.0- 4.9	0.0- 4.9	1.9- 4.9										
15	0.9- 3.2				0.8- 4.4	1.0- 5.0		1.0- 5.0			0.0- 5.0	0.0- 5.0	0.0- 0.5		1.0- 5.0			0.9- 3.2		3.4- 5.0			
16							0.3- 3.5				0.0- 8.6	0.0- 8.6	0.3- 3.5		0.5- 3.1 6.1- 7.6		7.6- 8.6						
17	1.0- 3.2					1.1- 5.3		1.1- 5.3			0.0- 5.3	0.0- 5.3	0.0- 0.5		1.1- 5.3			1.0- 3.2		0.9- 2.7 3.3- 5.3			
18											2.6- 3.7	2.6- 3.7			0.5- 2.3	2.6- 3.7	0.0- 1.1				0.5- 3.7		
19					0.0- 0.9						0.0- 7.9	0.0- 7.9								0.0- 4.8 5.0- 5.3 5.5- 7.9	0.0- 0.8		
20a										0.0-16.9	0.0-21.0	0.0-21.0					0.0-16.9*			0.0- 4.0 5.0- 5.7 7.0- 8.7 10.3-14.4		18.5-21.0	
20b			9.0-17.9	6.8- 7.3	5.4- 7.3 13.1-13.6						0.0-11.4	0.0-11.4			6.8- 7.3				2.7- 7.8 11.0-13.0	2.7- 3.0 3.3- 3.2 4.1- 7.8	2.7- 3.0	0.0-17.9	2.7- 7.8 11.0-13.0
21a																							
21b			4.0- 8.0																			4.0- 8.0	

[a]Mitigation for Visual Resources is special tower design; e.g., single pole structure.
/Mitigation for Land Use Resources is reduced tower height.

TABLE 1-8
LOCATIONS OF SELECTIVELY RECOMMENDED MITIGATION MEASURES
Mead/McCullough-Victorville/Adelanto Transmission Project

Link Number	#1 No New Access		#2 No Widening of Existing Access		#3 Access to Follow Existing Contours		#4 Close Access Road		#5 Special Tower Design[a]		#6 Dull Tower Finish	#7 Non-Specular Conductors	#8 Modify Tower Placement			#9 Modify Tower Spacing	#10 Reroute Line	#11a Curtail Construction	#11b Curtail Construction	#12 Preconstruction Field Review		#13a Preconstruction Field Review	#13b Preconstruction Field Review
	Biology	Visual	Biology	Land Use	Visual	Land Use	Biology	Land Use	Visual	Land Use	Visual	Visual	Biology	Visual	Land Use	Visual	Land Use	Biology	Biology	Earth	Paleo	Biology	Biology
22										15.4-16.8	0.0- 3.6 5.9-21.1	0.0- 3.6 5.9-21.1			13.4-13.5 13.6-13.7	0.0- 1.0 8.7-12.1					0.0- 2.0	16.0-21.2	
23			0.0- 3.5 4.5-13.8										0.0- 1.5		0.6- 0.8 2.6- 2.8 3.7- 4.0 4.2- 4.6	8.7-12.1 13.6-21.1	0.4- 0.5					1.5- 3.5 4.5-13.8	8.0-17.8 21.0-27.3
24a	16.0-17.8 18.8-19.8				15.0-22.2 26.0-27.3				15.0-22.2		0.0-27.3	0.0-27.3	18.8-19.8	15.0-22.2					8.0-17.8 21.0-27.3	0.6- 0.9 1.9- 6.6 6.9-11.9 12.1-12.4 14.7-16.7 17.0-17.6 17.7-18.7 23.0-27.1		0.0-17.8 21.0-27.3	8.0-17.8 21.0-27.3
24b					0.0- 1.4						0.0- 6.1	0.0- 6.1							0.0- 6.1			0.0- 6.1	0.0- 6.1
25			0.0-11.7																7.0-11.7			0.0- 7.0	7.0-11.7
26																				0.4- 0.6		0.0- 0.6	
27	0.0- 6.5						12.0-13.4		10.3-13.4	13.3-13.4	0.0-13.4	0.0-13.4	12.0-13.4	10.3-13.4					0.0- 6.5 8.0-12.0	0.0- 0.8 1.8- 5.8 7.2-10.0		0.0-12.0	0.0- 6.5 8.0-12.0
28											0.0- 3.2	0.0- 3.2							0.6- 3.2	0.0- 2.1		0.6- 3.2	0.6- 3.2
29											0.0- 2.1	0.0- 2.1							0.0- 2.1	0.8- 2.1		0.0- 2.1	0.0- 2.1
30			0.0- 2.1*													0.7- 2.1			0.0- 2.1			0.0- 2.1	0.0- 2.1
31			0.0- 5.7												3.6- 3.9**	0.0- 4.7	3.6- 3.9**					0.0- 5.7	
32			0.0-15.0 15.2-16.4								4.3-11.0	4.3-11.0	14.5-15.0						0.0- 7.6			0.0-14.5 15.2-16.4	0.0- 7.6
33			0.0- 6.5 11.2-15.5				14.6-14.8				4.8-13.5	4.8-13.5	14.6-14.8			10.4-11.0 13.6-15.4	4.4- 4.5 15.1-15.3		0.0- 8.2	6.5-11.0		0.0-14.6 14.8-15.5	0.0- 8.2
34			0.0- 1.4								0.6- 1.4	0.6- 1.4	0.0- 1.4									0.0- 1.0	
35			0.0- 4.7														4.4- 4.5					0.0- 4.7	
36			2.5- 4.3								0.0- 5.8	0.0- 5.8							0.0- 5.8	0.0- 2.5 4.3- 5.8		0.0- 5.8	0.0- 5.8
37											0.0- 7.3	0.0- 7.3							0.0- 7.3	0.4- 1.3 3.2- 4.6 4.8- 6.2 6.6- 7.3		0.0- 7.3	0.0- 7.3
38			0.0- 4.6 5.2-10.3								3.5- 5.2	3.5- 5.2			4.8- 5.3							4.6- 5.2	
39			0.0- 6.2																0.0- 6.2			0.0- 6.2	0.0- 6.2
40a			0.0- 6.2																0.0- 6.2			0.0- 6.2	0.0- 6.2
40b			0.0- 4.9												1.6- 2.1				0.0- 4.9			0.0- 4.9	0.0- 4.9
41			0.0-15.5								0.0-14.8	0.0-14.8							0.0-15.0			0.0-15.5	0.0-15.0
42											0.0-21.9	0.0-21.9							0.0-21.9	0.0- 2.4		0.0-21.9	0.0-21.9
43											0.0- 3.9	0.0- 3.9							0.0- 3.9	0.2- 3.9		0.0- 3.9	0.0- 3.9
44											0.0- 7.0 10.6-12.3	0.0- 7.0 10.6-12.3								0.0- 5.7		12.5-16.2	
45										0.0-14.0	0.0- 5.7	0.0- 5.7								3.4-16.2			

April 1985

[a]Mitigation for Visual Resources is special tower design; e.g., single pole structure.
Mitigation for Land Use Resources is reduced tower height.

*Choose Mitigation Measure #5 or #10.

**Choose Mitigation Measure #8 or #10.

TABLE 1-9
PRELIMINARY ROUTING OPTIONS COMPARED

A. STATELINE ALTERNATIVES

Routing Option A-1 - Links 0, 1, 3
Routing Option A-2 - Links 0, 1, 2, 4
Routing Option A-3 - Links 0, 1, 2

B. I-15 ALTERNATIVES

Routing Option B-1 - Links 5a, 5b, 5c, 7
Routing Option B-2 - Links 5a, 5b, 5c, 8
Routing Option B-3 - Link 9
Routing Option B-4 - Links 10, 12
Routing Option B-5 - Link 11
Routing Option B-6 - Links 12, 13, 14
Routing Option B-7 - Link 16
Routing Option B-8 - Links 14, 17
Routing Option B-9 - Links 14, 15
Routing Option B-10 - Link 15
Routing Option B-11 - Link 17
Routing Option B-20 - Links 5a, 45, 5c, 7
Routing Option B-21 - Links 5a, 45, 5c, 8

C. MOJAVE VALLEY ALTERNATIVES

Routing Option C-1 - Links 19, 20a, 20b
Routing Option C-2 - Links 19, 21a, 21b, 23
Routing Option C-3 - Links 22, 23
Routing Option C-4 - Links 19, 21a, 44, 20b
Routing Option C-5 - Links 21a, 44, 20b

D. KRAMER JUNCTION ALTERNATIVES

Routing Option D-3 - Links 42, 40a
Routing Option D-4 - Links 41, 37, 39, 40a
Routing Option D-5 - Links 41, 38, 39, 40a
Routing Option D-6 - Links 20a, 20b
Routing Option D-7 - Links 40b, 30, 31

Table 1-9 (continued)
Preliminary Options Compared

E. HELENDALE - VICTORVILLE/ADELANTO ALTERNATIVES

Routing Option E-1 - Links 24a, 43, 40b, 30, 31
Routing Option E-2 - Links 24a, 24b, 29, 30, 31
Routing Option E-3 - Links 25, 26, 27, 28, 29, 30, 31
Routing Option E-4 - Links 25, 26, 27, 36, 31
Routing Option E-6 - Links 25, 26, 32, 35
Routing Option E-8 - Links 25, 33, 34, 35

F. FORT IRWIN ALTERNATIVE

Routing Option F-1 - Link 6
Routing Option F-2 - Links 6, 21a, 21b
Routing Option F-3 - Links 6, 21a
Routing Option F-4 - Link 23

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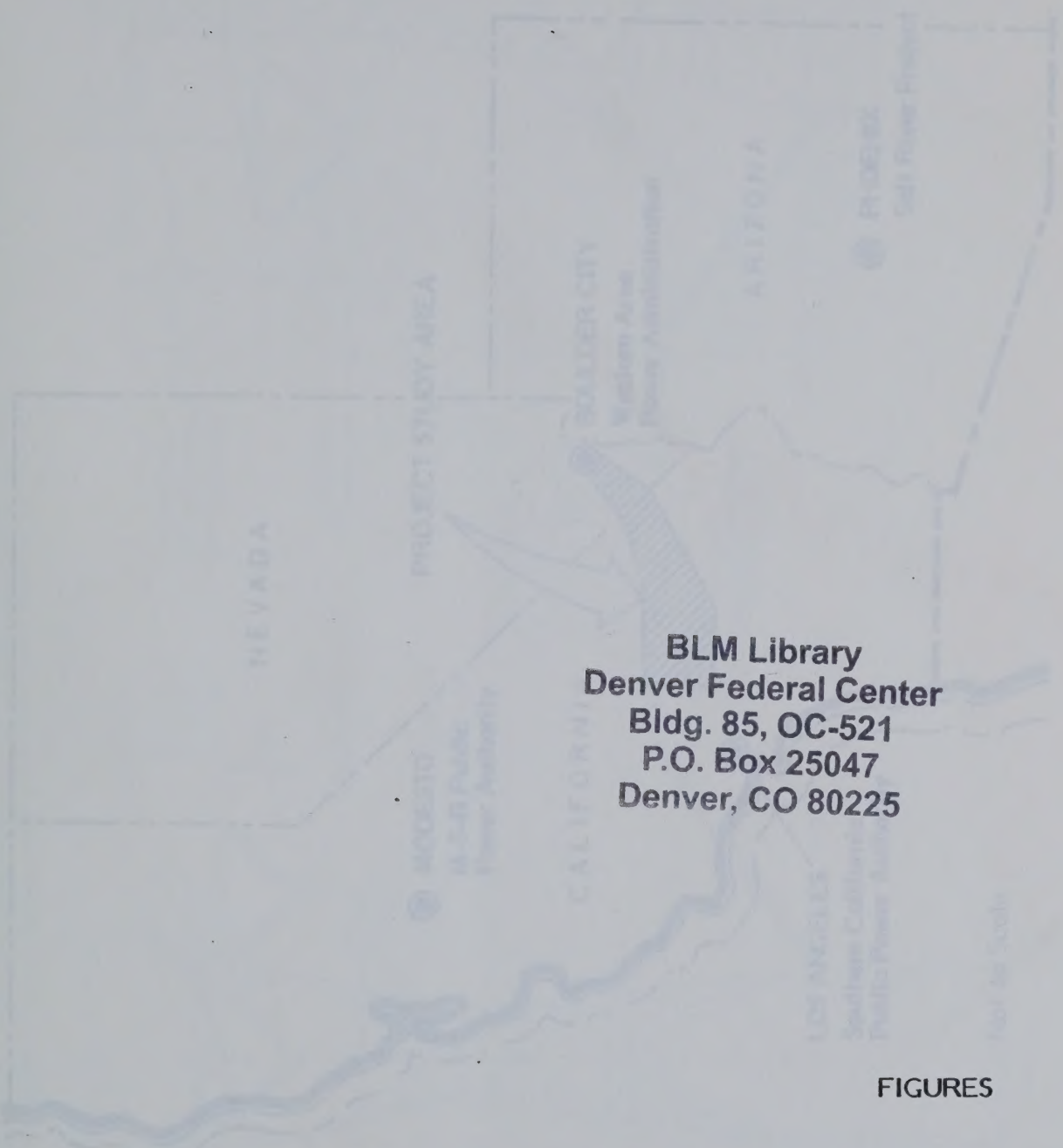


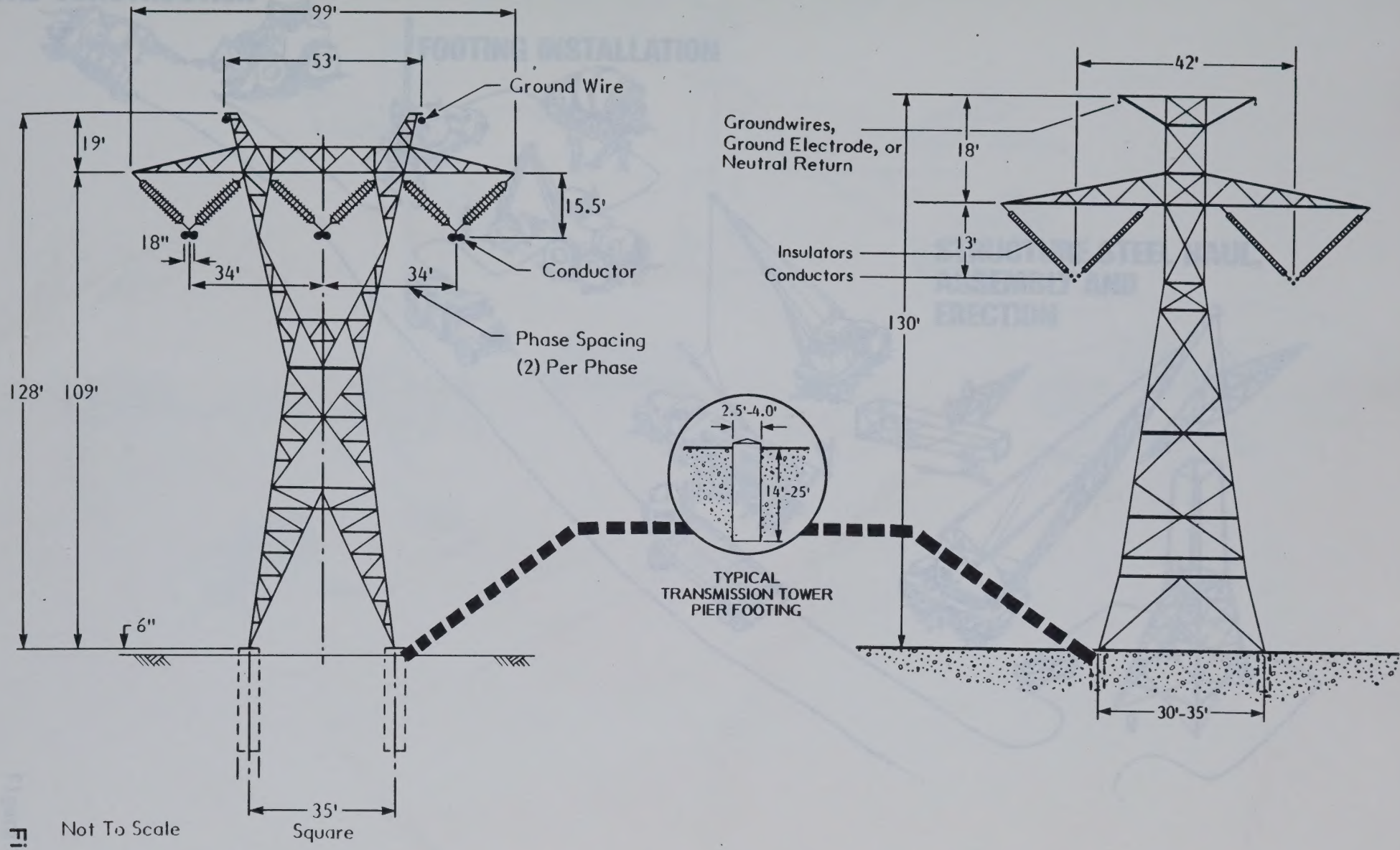
BLM Library
Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225

FIGURES

BLM Library
Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225

Figure 1-1

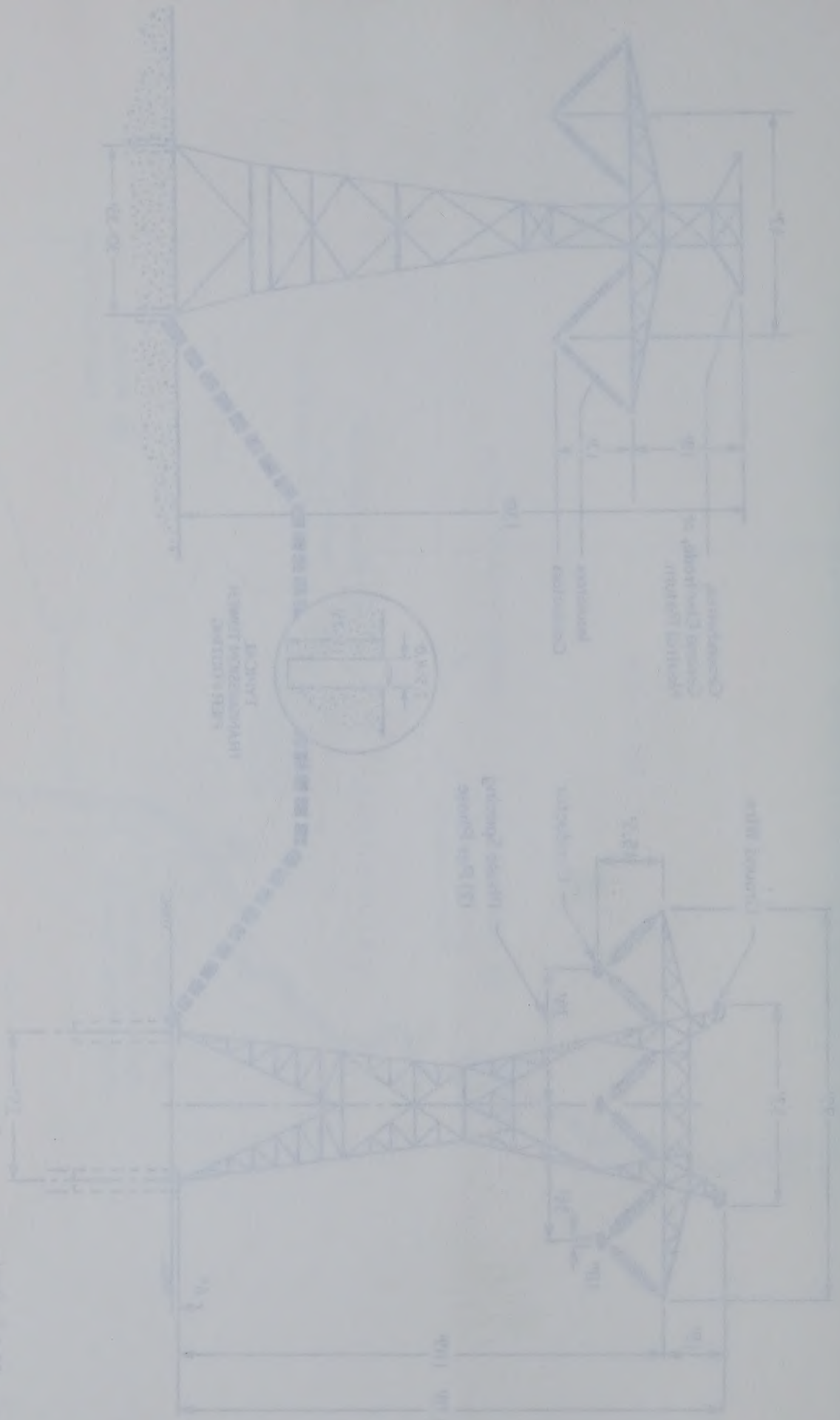
LOCATION OF PROJECT AND PROSPECTIVE SPONSORS



TYPICAL
500kV AC TOWER

TYPICAL
500kV DC TOWER

Figure 1-2



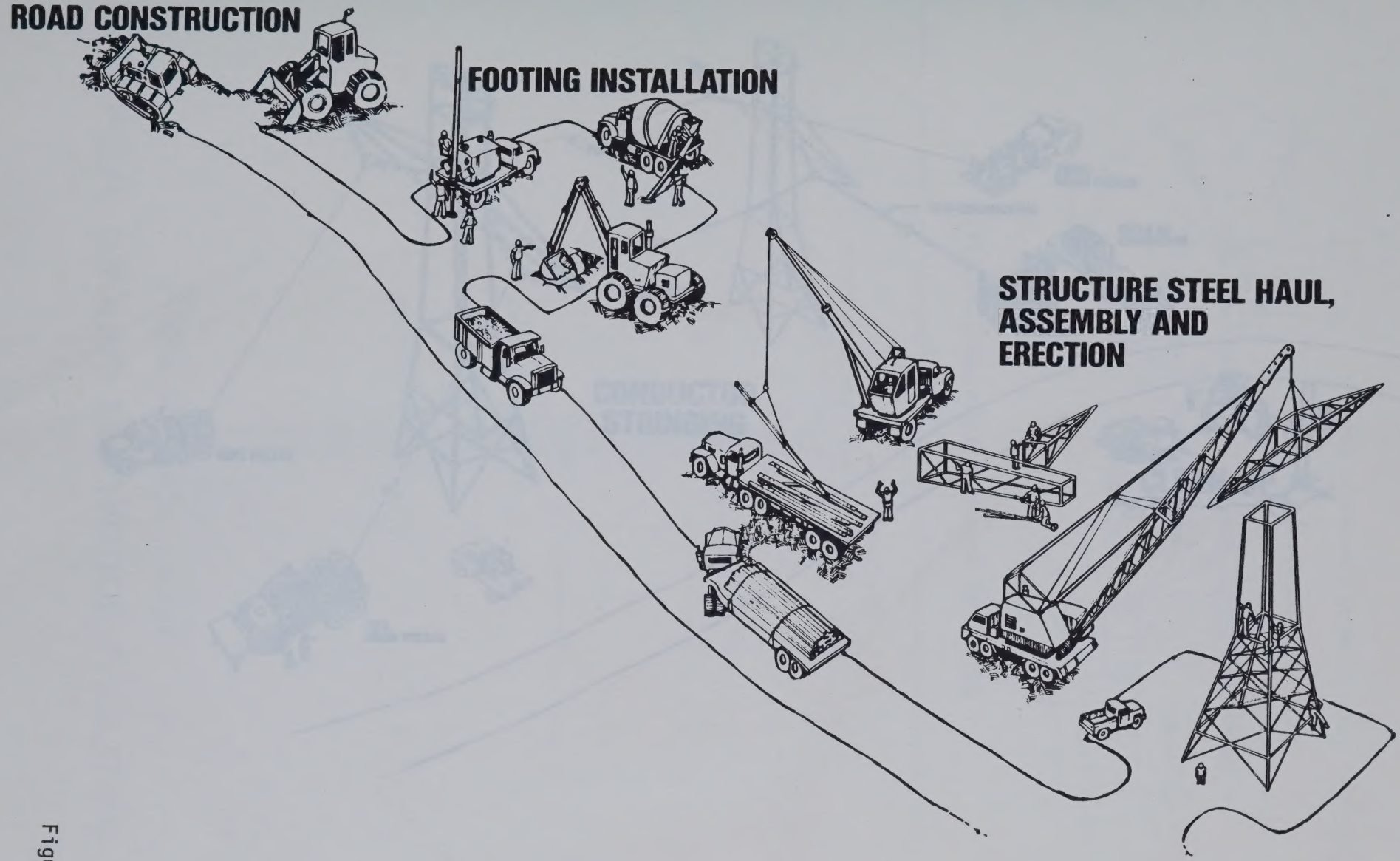


Figure 1-3

TYPICAL TRANSMISSION LINE CONSTRUCTION ACTIVITIES

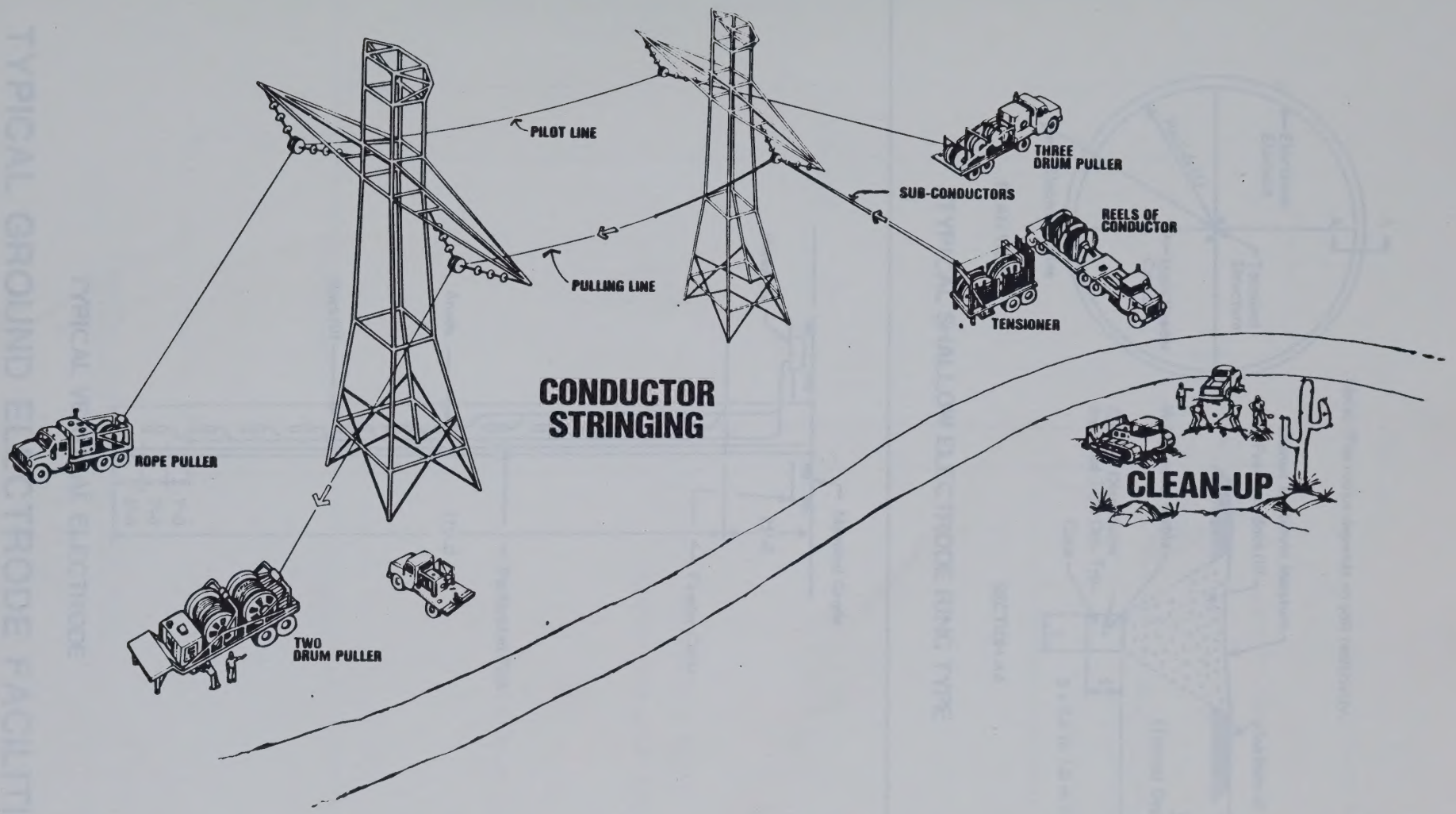
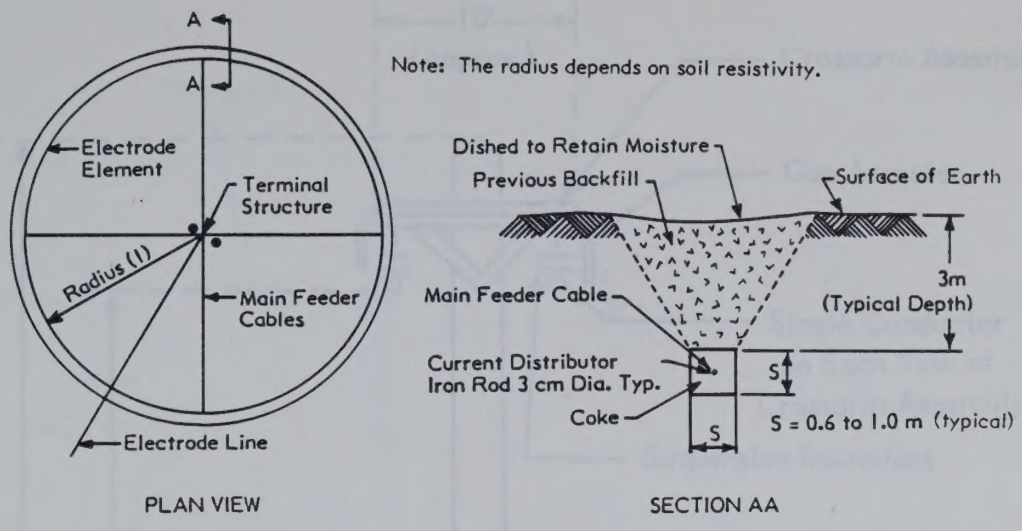


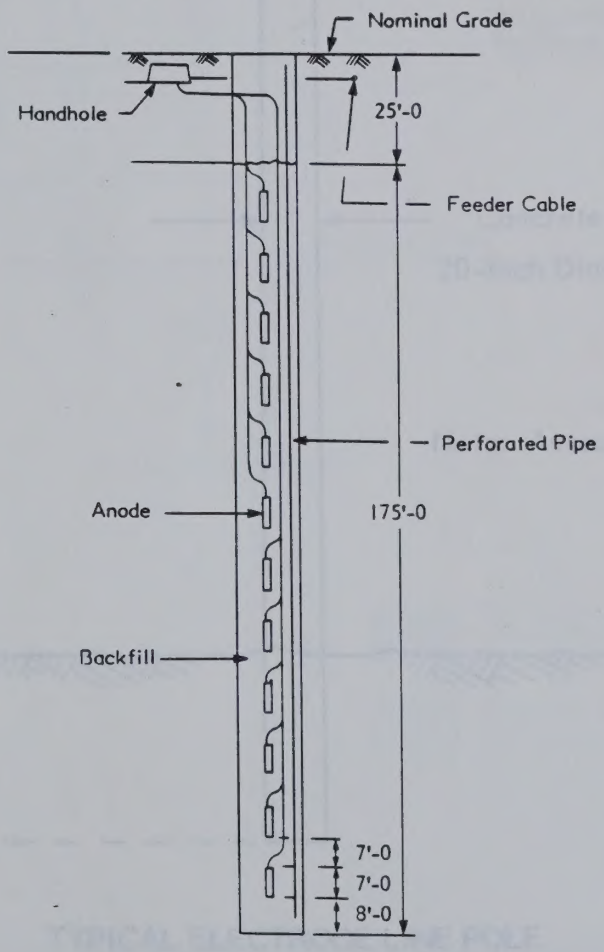
Figure 1-4

BASIC WIRE-HANDLING EQUIPMENT

SWIMMING
CONSTRUCTION



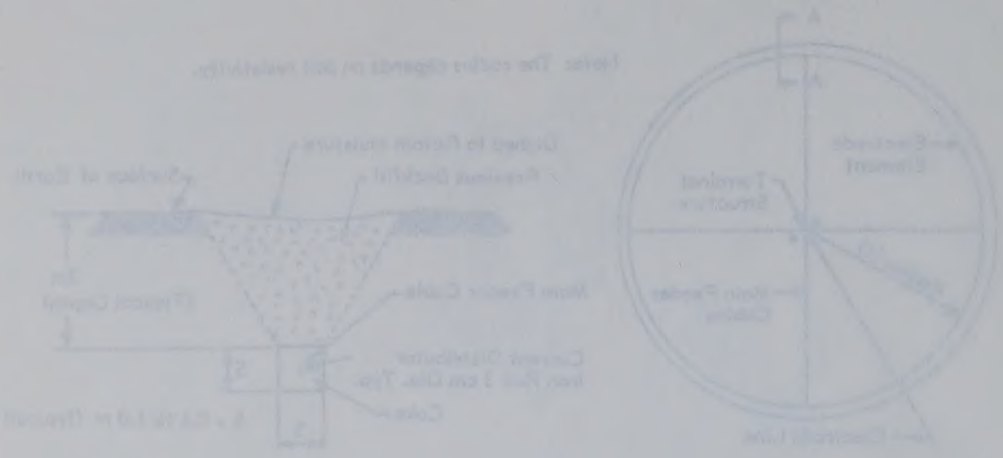
TYPICAL SHALLOW ELECTRODE RING TYPE

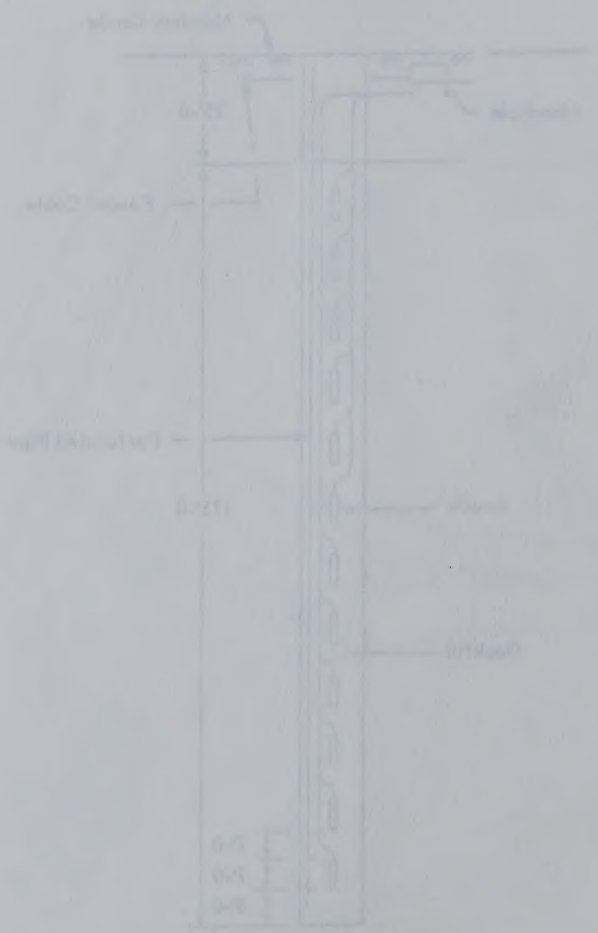


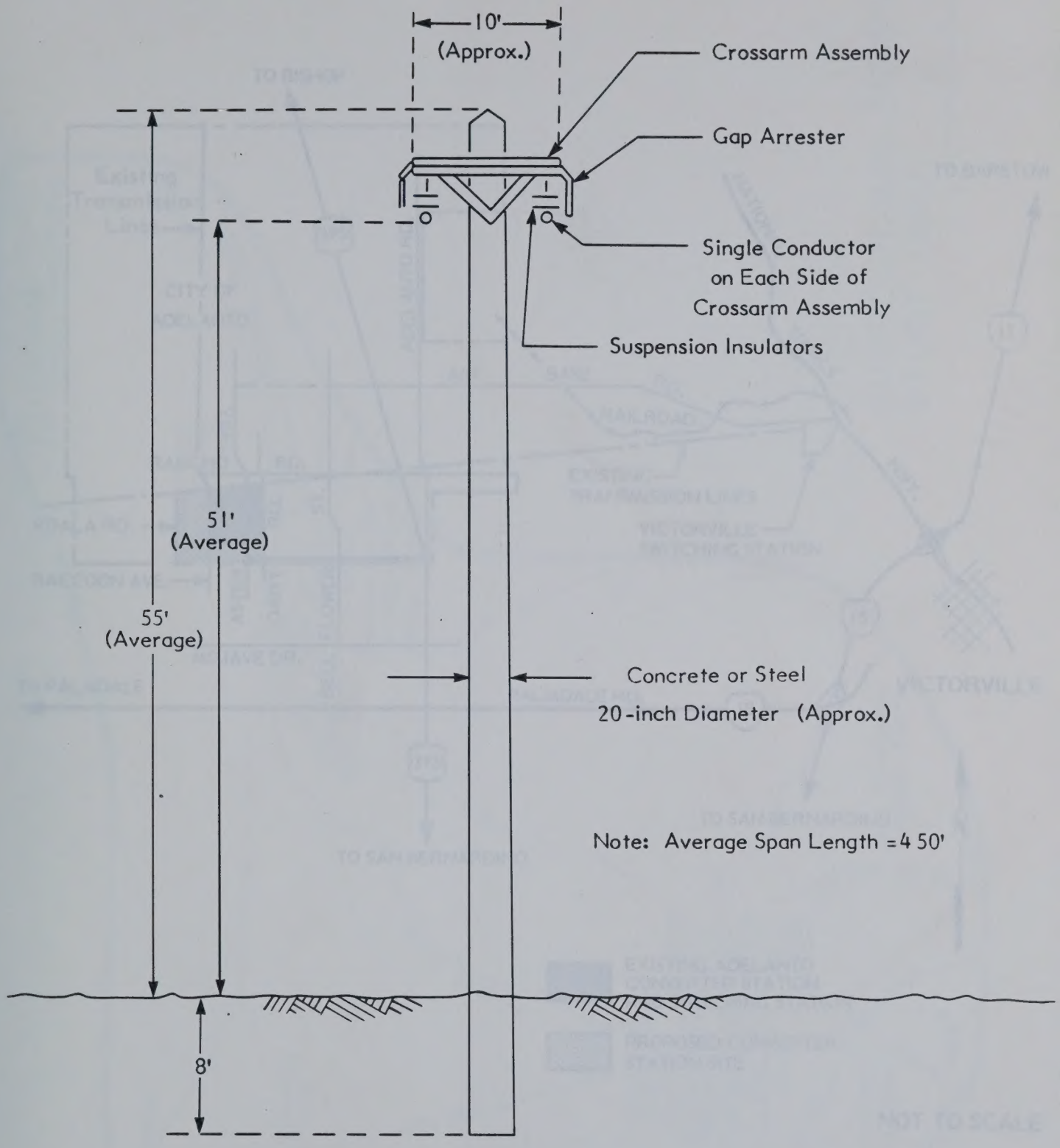
TYPICAL VERTICAL ELECTRODE

TYPICAL GROUND ELECTRODE FACILITIES

Figure 1-5

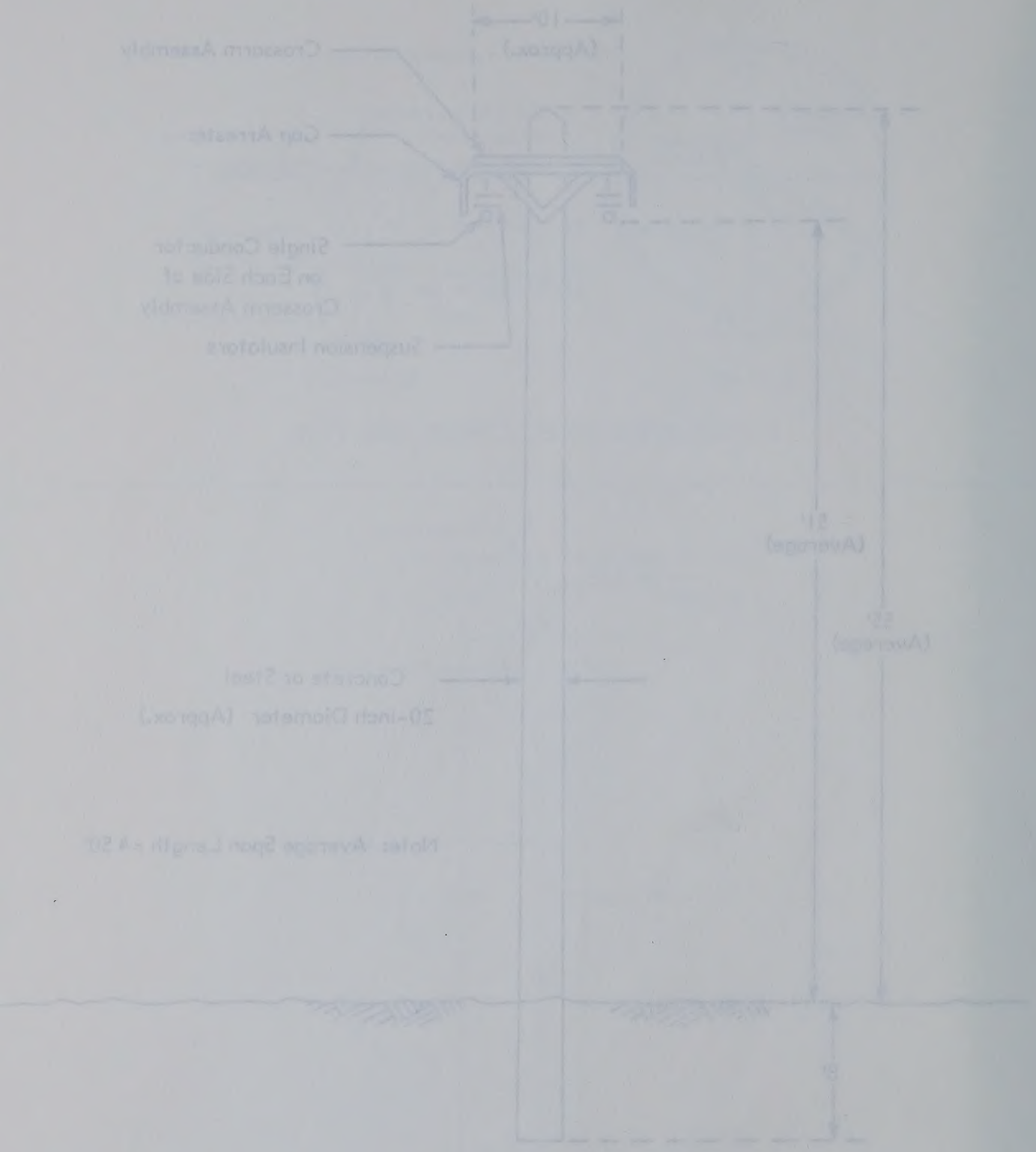


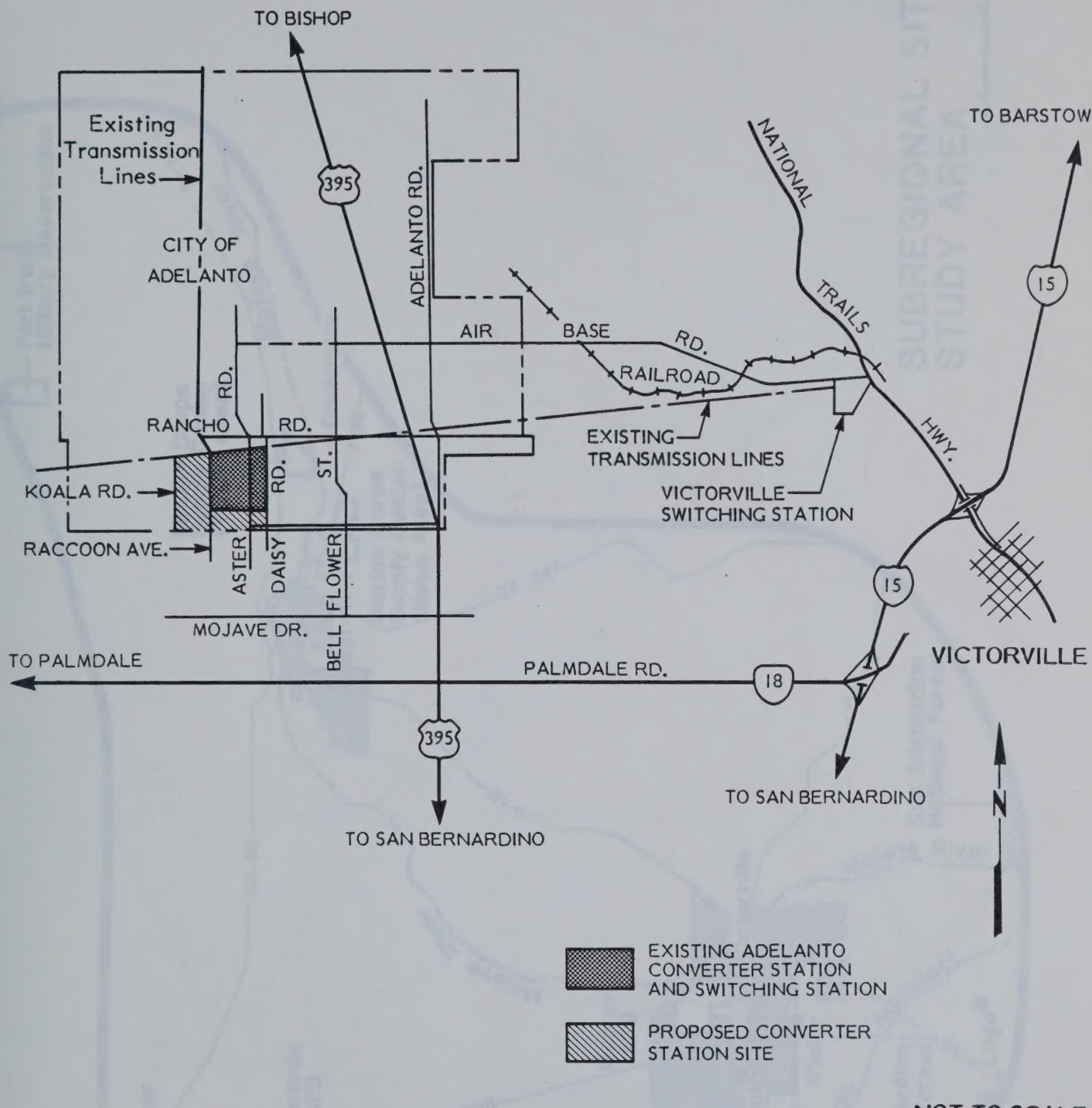




TYPICAL ELECTRODE LINE POLE

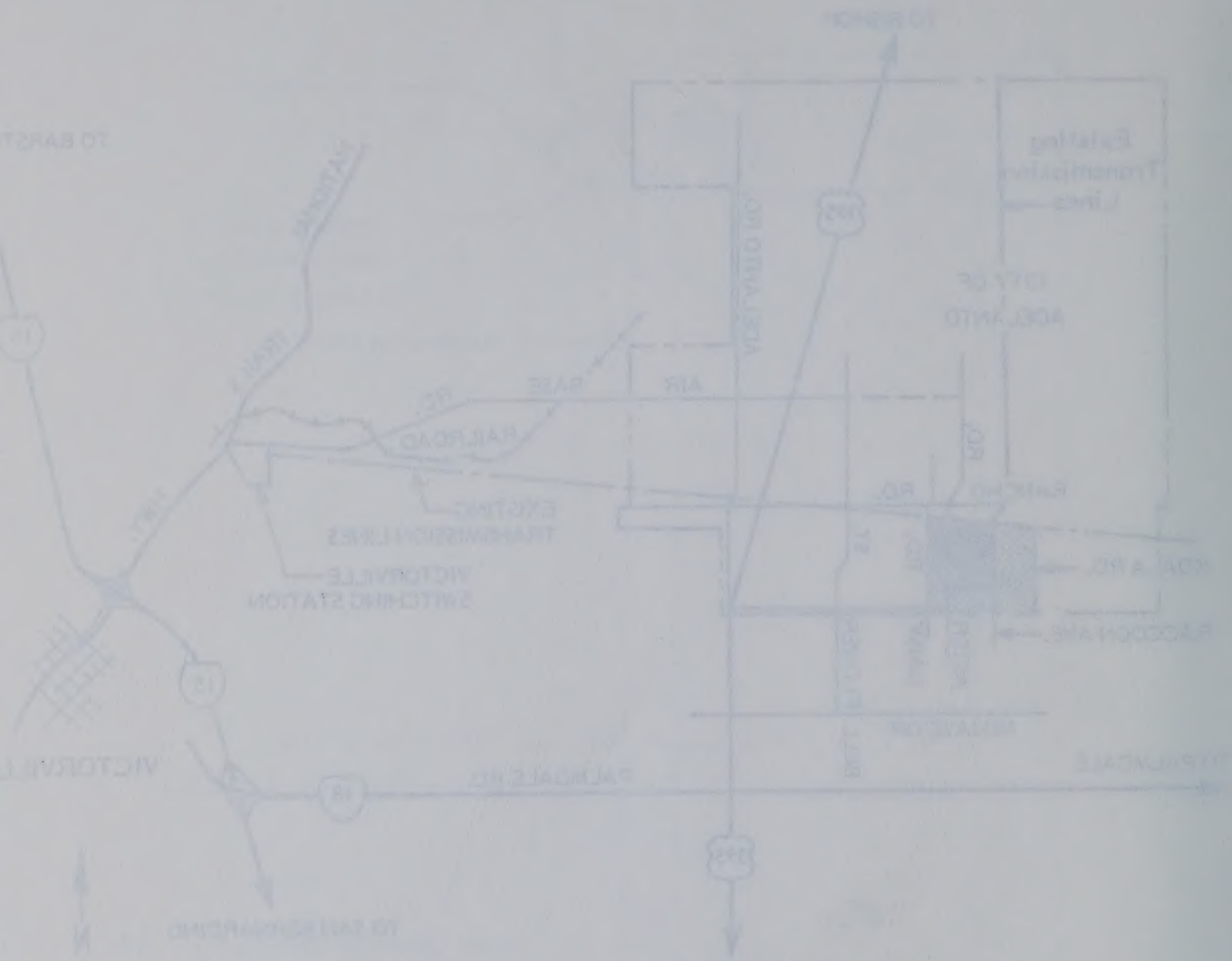
Figure 1-6





PROPOSED CONVERTER STATION SITE LOCATION

Figure 1-7



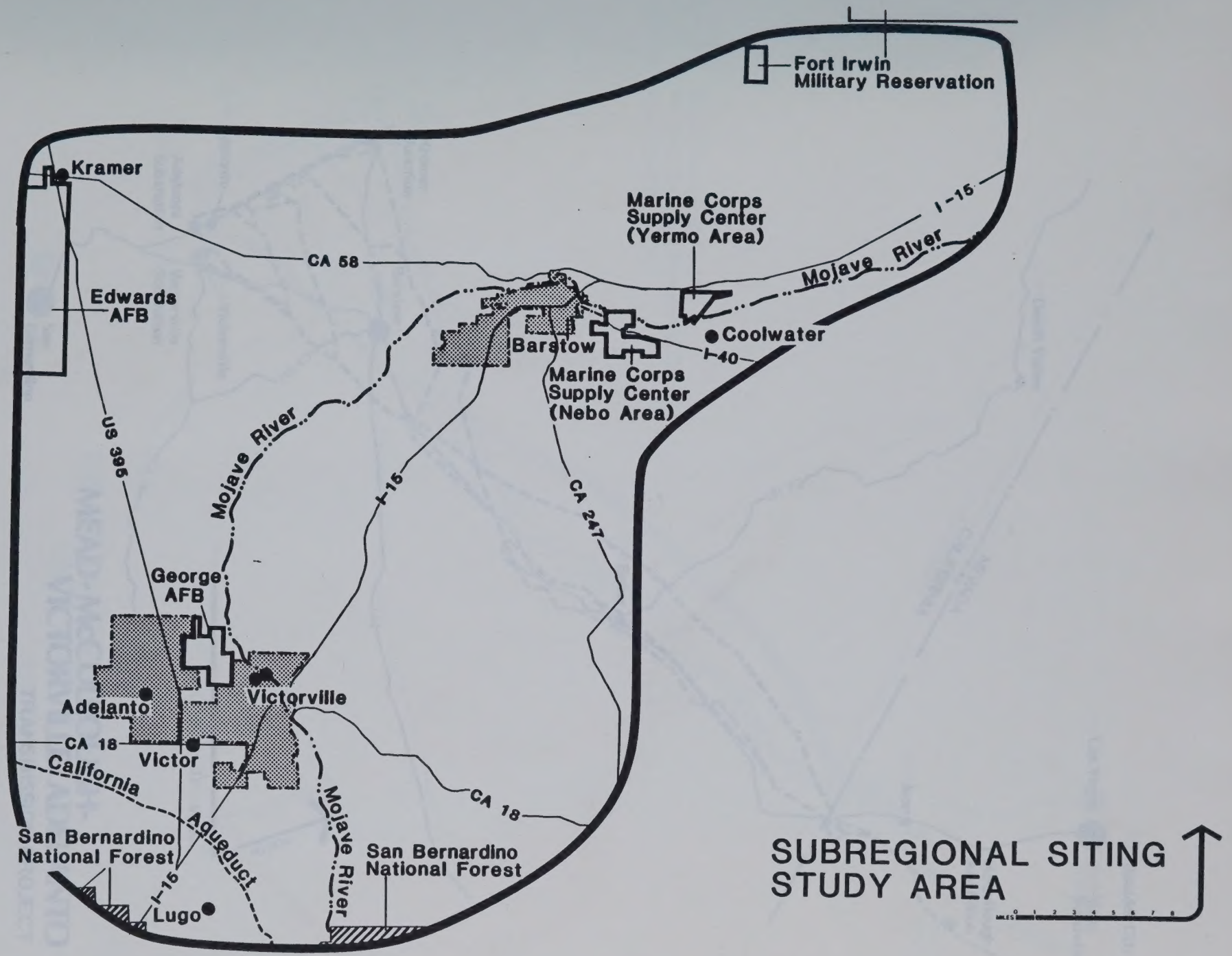
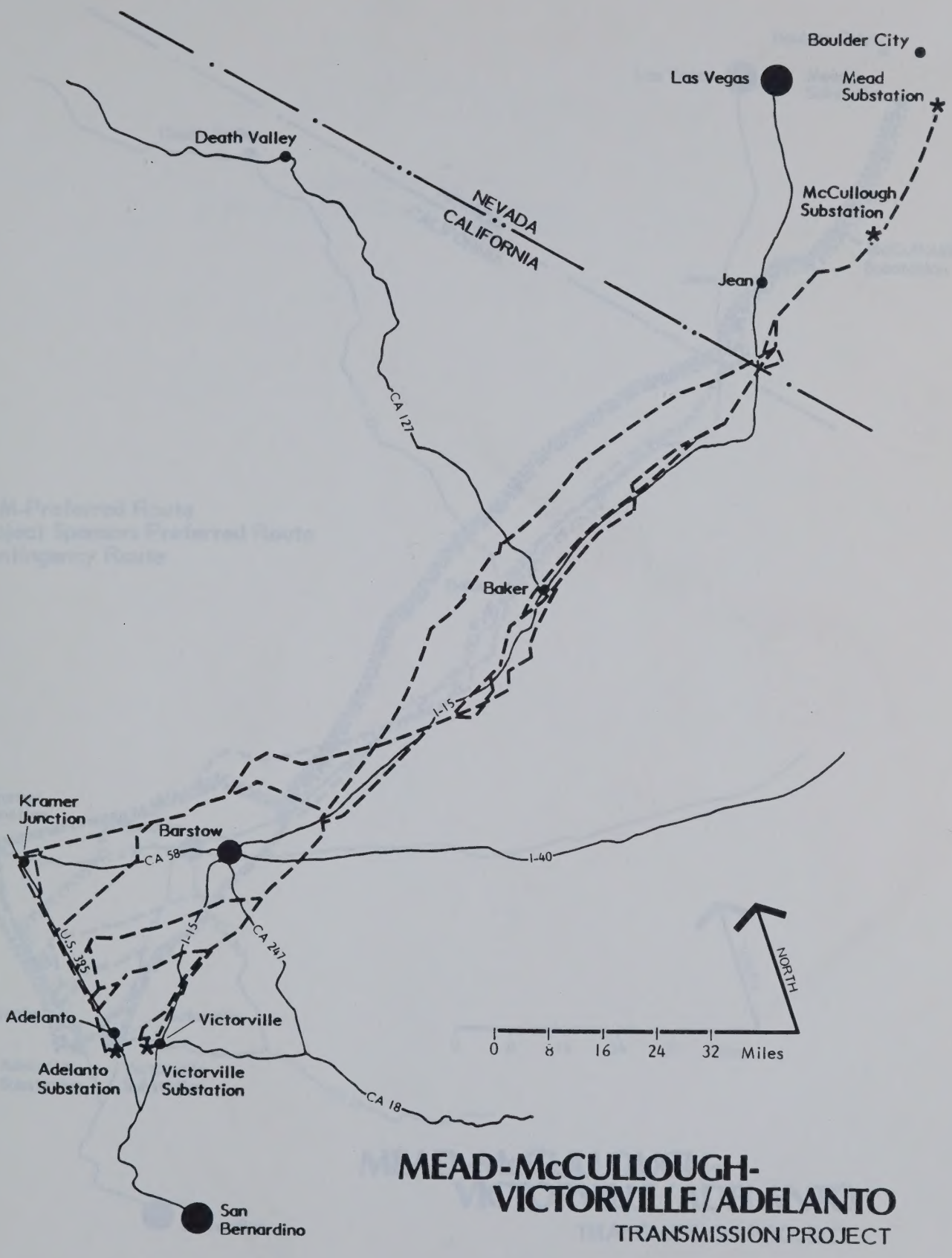

Fort Irwin
Military Reservation
Kramer
Marine Corps
Supply Center
(Yermo Area)
I-15
CA 58
Mojave River
Edwards
AFB
Coolwater
Barstow
I-40
Marine Corps
Supply Center
(Nebo Area)
US 395
Mojave River
I-15
CA 247
George
AFB
Adelanto
Victorville
CA 18
Victor
California
Aqueduct
CA 18
San Bernardino
National Forest
I-15
Lugo
Mojave River
San Bernardino
National Forest
SUBREGIONAL SITING
STUDY AREA
MILES 0 1 2 3 4 5 6 7 8

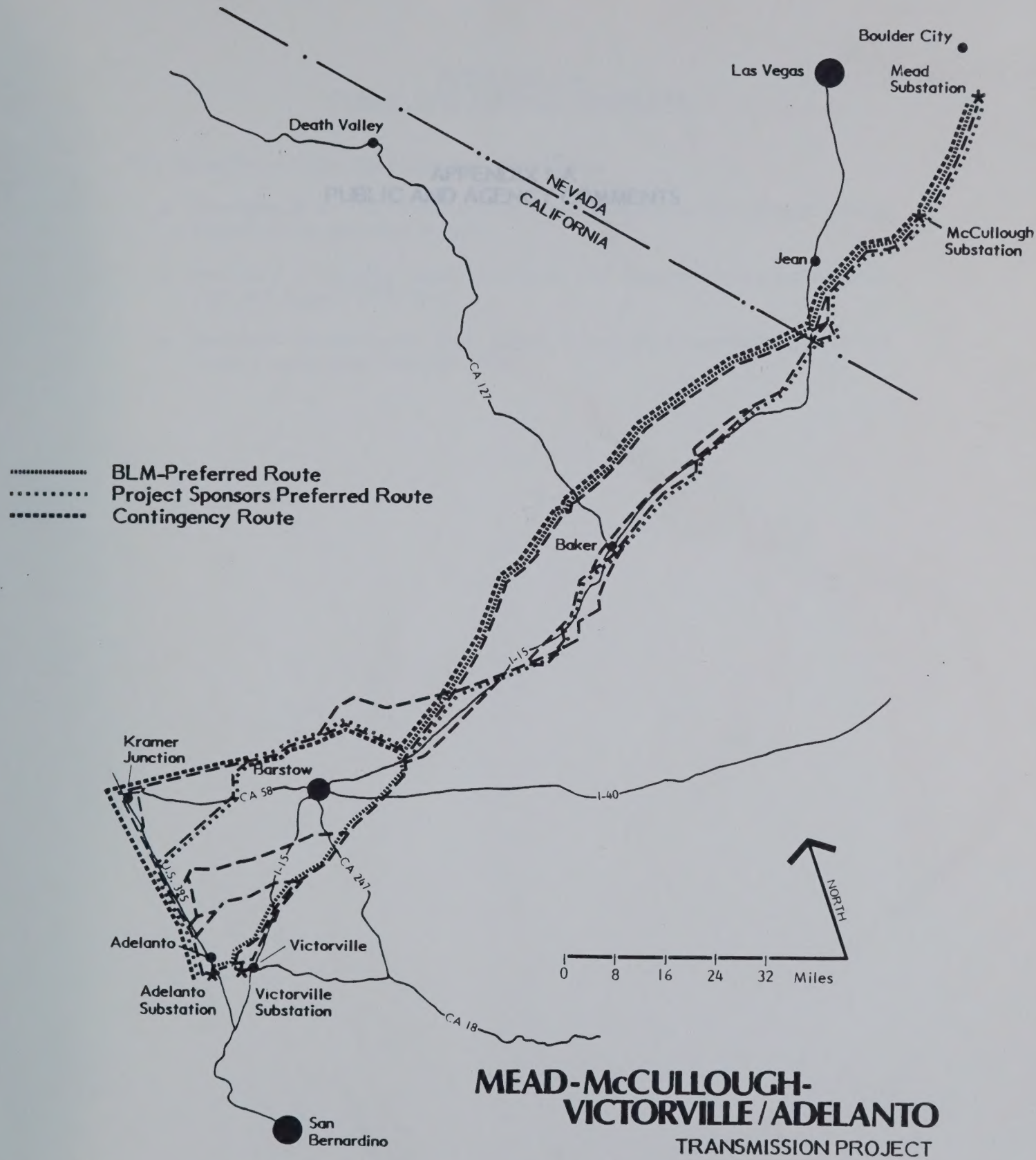
Figure 1-8

STUDY AREA
SUBREGIONAL SETTING



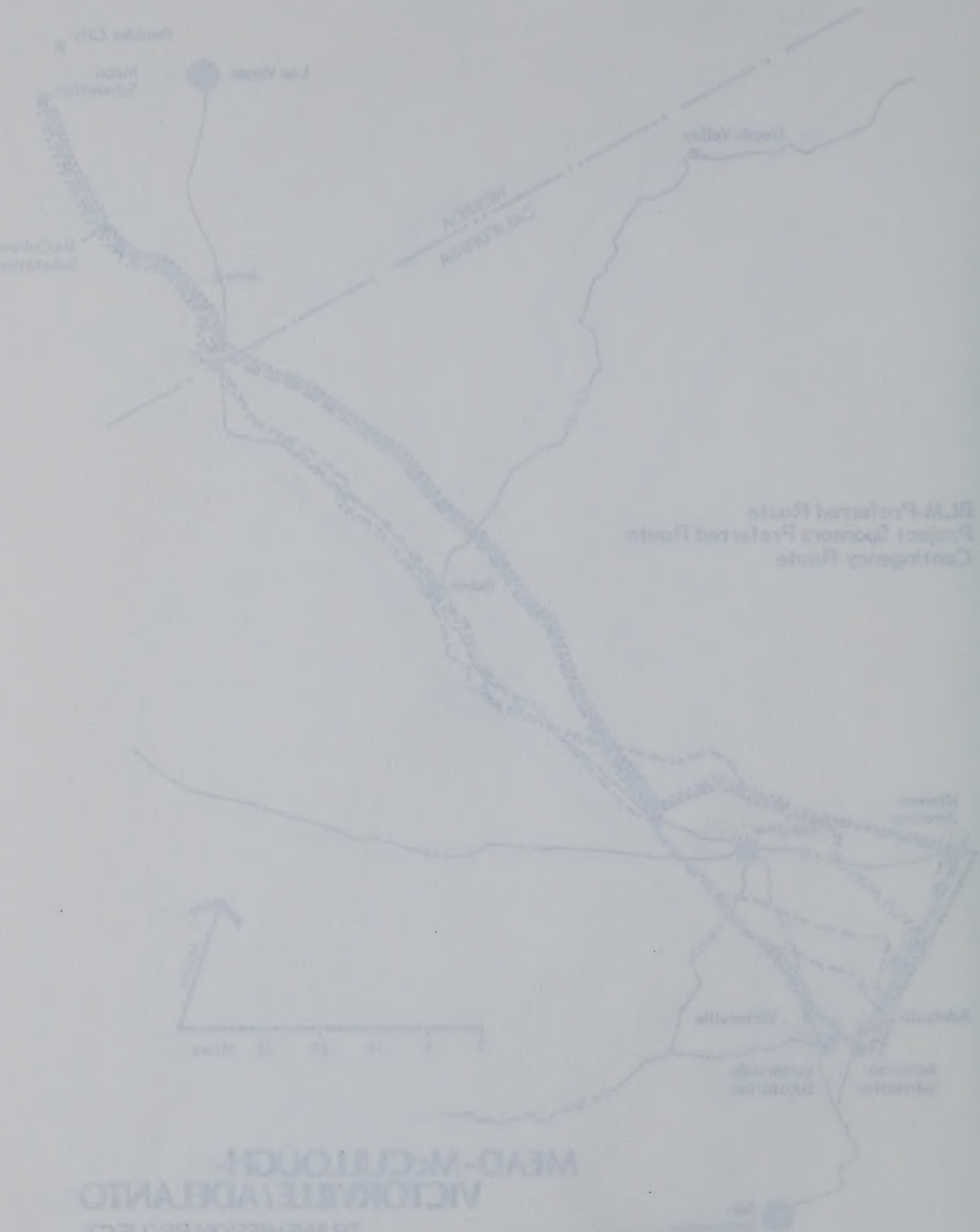
ALTERNATIVE ROUTE LOCATIONS

Figure 1-9



LOCATIONAL MAP OF FINAL ROUTING ALTERNATIVES

Figure 1-11



APPENDIX I-A
PUBLIC AND AGENCY COMMENTS

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This appendix contains the following information:

- Summary of written comments received in response to published notices regarding the proposed project;
- Summary of scoping meetings (public and agency) conducted between May and August 1984; and
- Summary of comments from public information meetings held in the project study area in March 1985.

APPENDIX I-A
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SUMMARY OF WRITTEN COMMENTS IN RESPONSE TO PROJECT NOTICES

TABLE A-1
SUMMARY OF COMMENTS RECEIVED IN RESPONSE TO NOTICE OF ASSESSMENT
July 1984

Agency	Summary of Comments
United States Department of the Interior Fish and Wildlife Service Laguna Niguel, California	Concerns requiring careful planning include high desert tortoise populations in Ivanpah and Shadow valleys; protection of raptors; important population of bighorn sheep on Clark Mountain (key watering, lambing and foraging areas should be avoided during use seasons); DER should identify areas of high density Mojave ground squirrel populations and provide mitigation for impacts; avoid and/or mitigate potential impacts to riparian habitat in Victorville-Barstow area.

TABLE A-2
SUMMARY OF COMMENTS RECEIVED IN RESPONSE TO THE NOTICE OF PREPARATION
November 1984

Name or Agency/Organization	Summary of Comments
W. Jensen San Bernardino, California	Environmental studies should include historic and prehistoric archaeological resources, and paleontologic resources. There is a high possibility for unearthing a diverse assemblage of such resources.
Department of the Air Force George Air Force Base, California	Concerned that transmission towers not penetrate take-off and landing zones on either end of AFB runways, or be close enough to base to affect Quantity/Distance zones around munitions storage areas. Edwards AFB should be contacted regarding very low flying aircraft areas.
Baker Area Chamber of Commerce Baker, California	The proposed line should not be placed in I-15 corridor; instead, it should be in the existing corridor about eight miles north of Baker. Town is isolated and depends on radio transmission for emergency vehicles; TV signal is weak. Concerns expressed about scenic views. If line must be built in I-15 corridor, a $1 million performance bond should be posted to guarantee no disruption of services.
Office of Historic Preservation Sacramento, California	Description of resources to be identified and procedures to be used in the impact assessment for cultural resources; consultation and agency contact suggestions.
Citizens for Mojave National Park Barstow, California	Opposed to any new lines entering the East Mojave National Scenic Area; concerned about visual intrusion. The only alternative we would support is along existing corridor eight miles to the north (DWP's Keany Pass-Silver Dry Lake route). DER must have credible needs assessment; project description needs are not credible. New lines are costly and perhaps obsolete, inappropriate technology; DWP should focus on conservation, decentralized energy production, and upgrading existing lines.
Southern California Gas Company Victorville, California	Concerns about effect of induced current on pipelines in area of proposed line; effect on cathodic protection; safety hazard to pipeline personnel. Encroachment agreement must be obtained before SCGC rights-of-way can be crossed.

Table A-2 (continued)
Summary of Comments

Name or Agency/Organization	Summary of Comments
California Department of Transportation San Bernardino, California	Note that if any work required in state highway rights-of-way, CALTRANS would be responsible agency, and may require mitigation measures. Considerations should include impact of radio reception and visible presence of line on highway users; impact of maintenance, road construction, and use of highway system; whether cross roads will be open to general public.
E. Bruce Lander Tujunga, California	Must consider potential impacts to paleontologic resources and ensure appropriate mitigation measures in accordance with various governmental guidelines.
Victor Valley Board of Realtors Victorville, California	On behalf of nearly 600 members (many of whom live outside valley and may not be aware of proposed project), ask that the line be kept out of Victor Valley as much as possible. Least objectionable route would be along Highway 58 to Kramer's Corner and then down Highway 395 to Adelanto.
M. Roeder Costa Mesa, California	Environmental studies should include assessment of paleontologic resources, involving records and literature search and walkover survey of routes; adequate mitigation measures for recognition and recovery of specimens which may be present.
Nevada Department of Transportation	Interested in reviewing DER to determine whether potential conflicts with highway system exist.
Clark County Department of Comprehensive Planning Las Vegas, Nevada	Consult with Coordinated Resource Management and Planning Group to determine potential impacts to grazing and the environment. Nevada Department of Wildlife has concerns regarding sensitive locations along existing corridor between Mead and McCullough for desert tortoise, bighorn sheep, kit fox; a comprehensive analysis should be done prior to construction to determine impacts. Concerned with possible long-term secondary impacts of maintenance roads open to public, especially effect of off-road vehicles in sensitive habitat.

Table A-2 (continued)
Summary of Comments

Name or Agency/Organization	Summary of Comments
Southern California Edison Company Long Beach, California	BLM has stated that the first line built in I-15 corridor must be located such that corridor will not preclude future lines in the corridor. Request that DWP develop a "Corridor Plan" to be mutually agreed on by SCE and DWP prior to BLM right-of-way grant. Consideration needs to be given to environmental sensitivities previously identified by SCE in Allen-Warner Valley Project.
California Department of Transportation Environmental Branch San Bernardino, California	Anticipate that the portion of Route 58 near Hinkley where an alternative route crosses will be widened to four-lane access-controlled highway in late 1987 or early 1988. Recommend any new line cross the state highway in same general location as present lines.
Nevada Office of Community Services	Route selection should be consistent with Ten-Year Coordinated Plan of Western Systems Coordinating Council. Existing transmission line corridors should be used.
Nevada Department of Wildlife Carson City, Nevada	Address effect on wildlife populations in area, especially desert tortoise and desert bighorn sheep; increased access to general public resulting from new or improved roadways; possibility of mitigation for wildlife habitat losses occurring on public domain. Following existing corridor to state line will have much lower impact to natural resources than creating new rights-of-way.
Nevada Division of Environmental Protection Carson City, Nevada	Project should have no significant impact on air; land clearing and vegetation disposal must conform with Clark County District Health Department rules; some stabilization or watering may be required during construction. Open burning is prohibited.
Nevada Public Service Commission Carson City, Nevada	Proposed line will require Utility Environmental Protection Act Permit.
Nevada Office of Historic Preservation and Archaeology Carson City, Nevada	Historic and prehistoric resources must be examined; indirect effects must be considered to minimize damage to properties of National Register quality.

Table A-2 (continued)
Summary of Comments

Name or Agency/Organization	Summary of Comments
California Department of Fish and Game Long Beach, California	DER should contain complete assessment of flora and fauna in project area, with particular emphasis on rare, endangered and locally unique species; documentation of direct, indirect and cumulative effects expected to biotic resources and, as required by CEQA, discussion of mitigation measures to offset impacts; recommend line be restricted to existing corridors adjacent to I-15 or other major roadways to reduce adverse impacts to desert resources; advise that Fish and Game must be notified of any proposed diversion of natural flow or changes in channel, bed or banks of any river, stream or lake.
California Department of Transportation Division of Aeronautics Sacramento, California	DER should address impact of airport noise and/or safety on project and impact of project on safety of airport operations; issue of compatible land uses adjacent to airport.
California Energy Commission Sacramento, California	DER should address project's potential public and occupational health impacts which may result from exposure to electromagnetic fields, ions, pesticides, and PCB substitutes; the number of people near the right-of-way should be estimated to determine the potential population exposures to toxic agents.
Department of Defense Department of the Army National Training Center and Fort Irwin Fort Irwin, California	Concerns include voltage capacity of existing line and whether rate of interference will increase with addition of new line; plans for marking proposed line/towers to allow easy recognition by pilots; restrictions which would be imposed on military maneuvers near line and maintenance roads.
Bureau of Reclamation Lower Colorado Regional Office Boulder City, Nevada	Proposed project will not interfere with any Bureau of Reclamation activities.

TABLE A-3
SUMMARY OF COMMENTS IN RESPONSE TO NOTICE OF INTENT TO PREPARE AN EIS
December 1984

Agency	Summary of Comments
U.S. Environmental Protection Agency San Francisco, California	The Draft ER should (1) identify water bodies in project area or downstream of the project that could be impacted; (2) demonstrate the project's consistency with Executive Order 11990, "Protection of Wetlands"; (3) address erosion and sedimentation control during construction and management plans for the proposed right-of-way; (4) identify water bodies or wetlands that will be spanned or will have towers placed in them; (5) ensure that debris, petroleum products or other hazardous materials do not enter wetlands and surface waters; (6) discuss need for access roads, and associated environmental effects; and (7) identify and assess appropriate mitigation measures to alleviate adverse environmental effects.

SUMMARY OF PUBLIC AND AGENCY SCOPING MEETINGS
May-August 1984

AGENCY CONTACTS

May - August 1984

MEETING RECORD

PROJECT: McCullough-Victorville Transmission Line
DATE: May 24, 1984
MEETING WITH: City of Adelanto
SUBJECT: Project Scoping

ITEMS DISCUSSED

Recently, the Victorville Daily Press has given quite a bit of attention to transmission lines, including articles on electrical effects and other environmental effects. Therefore, people are aware of some of the issues potentially involved with the proposed project.

Patricia Chamberlain (City Manager) will send us maps of city boundaries and zoning. The city plans to annex an area from Holly Road to south of Palm Dale Road, and one section to the west, adjacent to the city limits. Another three miles will be annexed to the north of the city limits.

Areas to be avoided in transmission line routing include the area north of Dutches Road, and the area west of Highway 395. These are prime development areas. The drop zones for George Air Force Base should also be avoided. Transmission lines should not be placed on section lines; rather, they should be placed from one-eighth to one-quarter mile off of the section lines.

Current plans for the City of Adelanto include two solar developments. One would be to the northeast of town (approximately 10 acres) and the other would be between the proposed prison and the Adelanto Converter Station currently under construction (approximately 30 acres).

A revised General Plan for the city will be completed in 6 months, and a draft will be published in about 4 months.

Other information about the area included:

- Rancho Road was closed due to construction of a new transmission line.
- The largest employers in the area are the Roadway Trucking firm and the prison (collectively employing 600-800 people).

Other contacts suggested were Richard Titera, San Bernardino County, and Jim Cox, City Manager of Victorville.

MEETING PARTICIPANTS

Patricia Chamberlain, City of Adelanto
Jim Mieding, DWP
Dick Incao, DWP
Garlyn Bergdale, Dames & Moore

MEETING RECORD

PROJECT: McCullough-Victorville Transmission Line
DATE: May 29, 1984
MEETING WITH: George Air Force Base, California
SUBJECT: Project Scoping

ITEMS DISCUSSED

The primary surface length at George is 10,050 feet with a width of 2,000 feet. The clear zone is approximately 3,000 feet with a 200-foot width. Approach clearance surface is 50,000 feet with a glide angle of 50 to 1. Descent is usually 250 feet per nautical mile. Runway 21 is a permanent southwest departure runway.

Personnel at the base had several comments regarding line placement near George:

- Avoid "blue areas" on navigation maps (this would be about 20 miles away from the base).
- They would prefer that the line parallel Highway 58, or be placed in the gullies below the level of the runways.
- Any alternative corridors south of the base should be south of the existing transmission lines.
- The minimum allowable distance for the line would be approximately 5 nautical miles from the end of the runway (also a descent point).
- Routing over Quartzite Mountain would potentially affect flight patterns.

Any development within the noise contours must be approved by the Airport Land Use Commission (contact Mary Hartman, San Bernardino County).

A regular contact program should be set up with George Air Force Base, to keep them informed of project developments.

MEETING PARTICIPANTS

William Bryan, George AFB
David Dorn, George AFB
Lt. Col. Rick Touslee, George AFB
Sgt. Elsenheimer, George AFB
Garlyn Bergdale, Dames & Moore
John Robinson, Dames & Moore
Jim Mieding, DWP
Dick Incao, DWP

MEETING RECORD

PROJECT: McCullough-Victorville Transmission Line

DATE: May 29, 1984

MEETING WITH: City of Victorville, California

SUBJECT: Project Scoping

ITEMS DISCUSSED

Much of the western side of Victorville has development constraints due to the noise impacts of George Air Force Base. The area is also within a takeoff and landing flight path.

The city does not charge property taxes, and so is concerned about who would pay for extending services through rights-of-way (e.g., curbs, sewer service).

The city is concerned about the line's effect on growth and development. They think it should be built along existing corridors. The city will require a Conditional Use Permit, which should be coordinated with the county's review process.

MEETING PARTICIPANTS

John Hnatek, City of Victorville
Dick Incao, DWP
Jim Mieding, DWP
Garlyn Bergdale, Dames & Moore
John Robinson, Dames & Moore

MEETING RECORD

PROJECT: McCullough-Victorville Transmission Line **DATE:** May 30, 1984

MEETING WITH: BLM; Barstow, California **SUBJECT:** Project Scoping

ITEMS DISCUSSED

Major considerations for line siting should include:

- The Early Man Site ACEC on the south side of Calico Mountain, east of the Mountain.
- Rainbow Canyon ACEC (paleontology and recreation resources; also a campground).
- Calico historic ghost town (under the jurisdiction of San Bernardino County).
- Harper Lake ACEC (birds; marsh habitat).
- Kramer Mountain ACEC (cultural resources).
- Juniper Flats ACEC (cultural resources).
- BLM sensitive species include the desert tortoise, the Mojave ground squirrel, and the woolly sunflower. Falcons and eagles nest on high mountain peaks.
- ACEC for the Mojave fish-hook cactus in the vicinity of Helendale, on the east side of the Mojave River.

Other information regarding the study area:

- A land exchange in the area of the Helendale Airport is scheduled for the end of this calendar year.
- There is a ground electrode site southeast of Coyote Lake, and a number of drilling permits have been issued in the area around Coyote Lake.
- The Manix to Fort Irwin "tank route" runs through the dry lake area.
- The BLM provided biological data and the VRM classes for the area.
- Note: Jim Chase is the new archaeologist in the Barstow area (BLM).

MEETING PARTICIPANTS

Sue Richardson, BLM
Mike Thompson, BLM
Dick Incao, DWP

Garlyn Bergdale, Dames & Moore
Ralph Kingery, Dames & Moore
Mark Schaffer, Dames & Moore

MEETING RECORD

PROJECT: McCullough-Victorville Transmission Line
DATE: May 30, 1984
MEETING WITH: City of Barstow, California
SUBJECT: Project Scoping

ITEMS DISCUSSED

The City of Barstow estimates that its population will increase by 65 percent by the year 2000 (current population is 19,208).

They recommend that the proposed line be built along existing transmission line corridors. Issues of concern include:

- Avoid Quartzite Mountain.
- Effects of the line on radio and television reception.
- Scenic resources: Calico Mountain, Stoddard Ridge, Sawtooth Ridge, and along Highway 247.
- Avoid Silver Lakes area.
- Avoid area around college in Barstow and the area southwest of town.

The city has tentative plans (verbal) for recreational areas which may include marinas, golf courses, etc.

They provided zoning maps and city boundaries.

MEETING PARTICIPANTS

Johnny S. O. Tan, City of Barstow
Thomas Bell, City of Barstow
Dick Incao, DWP
Garlyn Bergdale, Dames & Moore
Ralph Kingery, Dames & Moore

MEETING RECORD

PROJECT: McCullough-Victorville Transmission Line
DATE: May 31, 1984
MEETING WITH: San Bernardino County Planning
SUBJECT: Project Scoping

ITEMS DISCUSSED

The county thinks visual issues will be an important factor to consider with regards to following existing corridors. The military issues in the area must also be addressed.

The county does not have site approval, but will issue a Conditional Use Permit. If a new corridor is approved, they would probably amend the JUMP Plan.

Avoidance priority should be: (1) BLM, (2) the cities of Barstow, Victorville and Adelanto, (3) Department of Defense, and (4) San Bernardino County.

Other contacts recommended: Mojave Water Agency, Victorville County Water District, Airport Land Use Commission, and Edwards Air Force Base.

MEETING PARTICIPANTS

Chuck Bell, San Bernardino County
Clarissa Eid, San Bernardino County
Dick Incao, DWP
Garlyn Bergdale, Dames & Moore
Ralph Kingery, Dames & Moore
Mark Schaffer, Dames & Moore

MEETING RECORD

PROJECT: McCullough-Victorville Transmission Line
DATE: May 31, 1984
MEETING WITH: BLM; Riverside, California
SUBJECT: Project Scoping

ITEMS DISCUSSED

BLM provided additional data on wildlife and vegetation for the study area.

Edwards Air Force Base is the overall contact for the military in the area. We should contact Sue Richardson (BLM, Barstow) regarding the proposed land exchange between the BLM and the military. The contact at Edwards is Phil Brady (805) 277-3897.

Other BLM contacts include Garth Portilla, District Archaeologist, and Carol Rector who has done a lot of work along the Mojave River.

The EA process was discussed. The BLM said that after corridor alternatives are identified, if they are not the same as BLM-identified corridors, it will take approximately 6 months to amend the California Desert Conservation Area Plan.

MEETING PARTICIPANTS

Dick Incao, DWP
Bill Collins, BLM
John Foreman, BLM
Garlyn Bergdale, Dames & Moore
Ralph Kingery, Dames & Moore

MEETING RECORD

PROJECT: McCullough-Victorville Transmission Line
DATE: July 23, 1984
MEETING WITH: Clark County, Nevada
SUBJECT: Project Scoping/Issues and Concerns

ITEMS DISCUSSED

Clark County named the following items as things to be considered in our environmental study for the project:

- BLM grazing allotments
- Bighorn sheep habitat
- Recreation at Roach Lake (land sailing)

The County will want to know exactly what economic benefits it will gain from the project; that is, how much revenue it will receive from property taxes, and any other economic benefits (employment, sales of goods and services, etc.).

They suggested that we contact the Colorado River Commission during our environmental studies.

They want to know what else is planned in the regional transmission system, and how many other lines may be built.

The County was very pleased with the Mead to Phoenix EIS, and thought it was well-written and concise. They felt if the McCullough/Victorville ER was prepared in a similar format the document would be more than adequate for county permit process. At the end of the environmental process for the project, DWP will have to acquire a Use Permit from the County. It will be a 90-day approval process.

They appreciate being informed early of our planning, and want to stay informed on the project progress.

MEETING PARTICIPANTS

Richard Holmes, Clark County
Richard Bobertz, Clark County
Dennis Bechtel, Clark County
Jim Mieding, DWP
Kemp Anderson, DWP
Garlyn Bergdale, Dames & Moore

MEETING RECORD

PROJECT: McCullough-Victorville Transmission Line
DATE: July 26, 1984
MEETING WITH: Edwards Air Force Base
SUBJECT: Line Routing Constraints

ITEMS DISCUSSED

The major constraints to transmission line routing near Edwards AFB are the low-level flight paths used for Air Force training. These are mapped on a mylar overlay which we should copy for our records. Contact Walt Benge, Air Space Manager, at Edwards (277-2446; out of town until August 10, 1984).

The Air Force recommends routing the new line along the same corridor as existing lines to avoid introducing any new obstacles to their flight paths. They would prefer that new lines be located as close as 0.5 mile from other lines, and think that 2 miles are the maximum acceptable separation distance between lines.

Most of the low-level flight paths are 4 miles wide, although one path is 10 miles wide. They fly from 100 to 200 feet above ground in these areas.

FAA Part 77 does not address special uses by the military.

Edwards AFB is oriented towards research and development, while George AFB is an operational base. It was suggested that we meet jointly with Edwards and George when we have developed more specific line routes.

Edwards AFB is the Department of Defense Contact for San Bernardino County.

Land exchanges between the BLM and the military are being done throughout San Bernardino County, in an effort to consolidate BLM lands and keep military operations away from population centers (Barstow, Victorville, etc.). The Barstow office of the BLM is the contact point for more information.

We should also contact the Airport Land Use Commission.

MEETING PARTICIPANTS

Bob Johnstone, Edwards AFB
Pauline Kiser, Edwards AFB
Jim Mieding, DWP
Kemp Anderson, DWP
Garlyn Bergdale, Dames & Moore
Lucy Bowen, Dames & Moore

MEETING RECORD

PROJECT: McCullough-Victorville Transmission Line
DATE: July 26, 1984
MEETING WITH: George Air Force Base
SUBJECT: Line Routing Constraints

ITEMS DISCUSSED

George AFB would prefer a line route south of the base. Going north of the base, there is more potential for interference with flight paths and the Instrument Landing System (ILS). They are not as concerned about the new line being a safety hazard as they are about it limiting the amount of training area for low-level flights. The base currently has F4s, OV10s, and helicopters.

They agree with personnel at Edwards who recommend paralleling existing lines to avoid interference with flight paths.

MEETING PARTICIPANTS

David Dorn, George AFB
Bill Bryan, George AFB
Kemp Anderson, DWP
Jim Mieding, DWP
Bob Carpenter, DWP
Garlyn Bergdale, Dames & Moore
Lucy Bowen, Dames & Moore

MEETING RECORD

PROJECT:	McCullough-Victorville Transmission Line	**DATE:**	August 1, 1984
MEETING WITH:	BLM; Riverside, California	**SUBJECT:**	MOU/Study Approach

ITEMS DISCUSSED

The format and content of the Memorandum of Understanding (MOU) between the BLM and DWP were discussed. It will be a two-party agreement, with a statement that Dames & Moore will be responsive to both parties. A statement will also be included to document the BLM's concurrence with the selection of Dames & Moore as a third-party consultant for the Project. The MOU will delineate specific responsibilities of DWP, BLM and Dames & Moore. DWP will revise the MOU based on Bill Collins' draft, and send it to Bill for final revisions and execution.

After some discussion, it was determined that the environmental document for this project will be a joint document (combined EIR/EA), rather than two separate documents. The combined document will be referred to as an Environmental Report (ER). It was also agreed that the environmental studies will use existing data as much as possible.

The general approach to the study was discussed, and Bill Collins made the following points:

- We want to preserve a corridor for this and other projects, even though the ER will only address the site-specific route for this particular line. The corridor established should be sufficient for future expansion (available for at least two transmission lines). We do not want to make future use difficult for other utilities.

- Slight variations from established corridors will not be a problem, and would not require an EIS, because the BLM would not try to make such variations part of a future BLM-approved utility corridor.

- The BLM takes lead responsibility for public land uses, but generally defers to other agencies or local governments in issues involving large amounts of private land.

During a discussion of potential alternative routes to consider in the ER, Bill Collins stated that there may be a problem with going north of Baker (as suggested in the Baker Scoping Meeting of July 24, 1984). He said that the School District owns a lot of the land north of town, and may not allow a transmission line corridor.

Carl Haase said we should check to see whether it is feasible to go north of the IPP line near Ft. Irwin. He thinks that it may not be possible without crossing Ft. Irwin lands.

Bill Collins provided a list of BLM resource specialists who will be assigned to this project. He does not have the name of anyone in Nevada yet, but will provide that also. The list of California people is attached.

The next regular meeting with BLM is scheduled for 10:00 a.m., September 4, 1984 at Riverside.

MEETING PARTICIPANTS

Bill Collins, BLM
Jim Mieding, DWP
Carl Haase, DWP
Dick Incao, DWP
Kemp Anderson, DWP
Garlyn Bergdale, Dames & Moore
Lucy Bowen, Dames & Moore

LIST OF BLM RESOURCE CONTACTS
(California)

Bill Collins	(714) 351-6373
Larry Foreman (Biologist)	(714) 351-6402
Garth Portilla (Archaeologist)	(714) 351-6402
Mike DeKeyerl (Realty Specialist, Barstow)	(619) 256-3595
Ron Morrison (Realty Specialist, Needles)	(619) 326-3896

PUBLIC SCOPING MEETINGS

July 1984

SCOPING MEETING SUMMARY
BOULDER CITY, NEVADA
July 23, 1984

Jim Mieding (DWP) described the need and geographic location of the proposed project, and explained that the purpose of the meeting was to obtain early public input on issues and concerns. Garlyn Bergdale (Dames & Moore) then described the map showing the I-15 corridor and the two general alternatives to the Victorville/Adelanto areas.

The BLM representative at the meeting, Ron Morrison, offered the following comments:

- The BLM will assign a Realty Specialist to the project (probably Frank Maxwell). Other BLM people to contact may include Mike DeKeyerl and Sue Richardson at the Barstow office. The CDCA may take the lead on this project for the BLM; we should have the California BLM check with Frank Maxwell on this.

- People in the Baker and Barstow areas do not like transmission lines and may resist strongly on this.

- There is a proposed Mojave National Park which crosses I-15 and crosses into the Clark Mountains at one point. The IPP line runs just north of it. BLM has made a slight modification in the park's proposed boundary; Morrison will send a copy of the map. The BLM is basically neutral in its position regarding the park. It is in a scenic area containing an ACEC and WSA, and BLM wants to keep visual impacts to a minimum. Contact Peter Burk of the Sierra Club for further information.

- Morrison sees no strong reason for studying alternative routes from McCullough to the state line, but he said it would not hurt to look at some other routes.

- There are a number of active mines in the area, most of which are on BLM lands.

- Morrison thinks it would be best to stay east of the IPP line and Roach Lake, because of the recreation at the lake (land sailing).

- Other special interest groups in the area include Friends of the Desert and the Desert Tortoise Society. Frank Maxwell can provide names of others.

- Southern California Edison (SCE) is in the pre-application stage for a coal-fired power plant which will burn coal fines. Two alternative sites

BLM Library
Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225

have been mentioned: Ivanpah and Mountain Pass. Carol Prince is the contact at SCE. The plant would provide power to a rare earth mine at Mountain Pass.

- Jim Mieding mentioned that the BLM seems reluctant to take a strong position on projects in the early stages, and asked whether that reluctance will fade as the project progresses. Morrison said that they are reluctant due to public pressures. They like to wait to see how the public is reacting to a proposal.

SIGN-IN SHEET

McCULLOUGH TO VICTORVILLE TRANSMISSION LINE PROJECT

PUBLIC MEETING

July 23, 1984

Boulder City, Nevada

PLEASE PRINT

NAME	ADDRESS	PHONE NUMBER
Ron Morrison	BLM, Needles, CA RAH	619-326-3896
Ed Kliska (WAPA, Mead)	1522 5th Street, Boulder City 89005	702-293-3641
Pat Hall	BLM, Box 7384, Las Vegas, Nevada 89125	702-388-6627
Jim Mieding	DWP	
Kemp Anderson	DWP	
Ed Freudenburg	DWP	
Garlyn Bergdale	Dames & Moore	
Lucy Bowen	Dames & Moore	

SCOPING MEETING SUMMARY
BAKER, CALIFORNIA
July 24, 1984

Jim Mieding (DWP) described the need and geographic location for the proposed 500-kV line, and explained that the purpose of the scoping meeting was to obtain early input on issues and concerns in the study area. Garlyn Bergdale (Dames & Moore) then explained the map showing the I-15 corridor, with two general alternatives to the Victorville/Adelanto areas. He also summarized the comments from the previous scoping meeting held in Boulder City.

After some clarification of where existing transmission lines are located in the area and who owns them, the following comments were voiced:

- Several people expressed the desire that the new line be built in the corridor where the three existing lines are located. Jim explained the problems with reliability, and said that this was not DWP's preference but that it would have to be considered as an alternative.

- Garlyn reiterated that the I-15 corridor is simply a "starting point" since it is approved as a utility corridor by the BLM. We will look at other alternatives where appropriate. He asked whether people would prefer an alternative south or north of Baker (if the line were not built in the corridor with three existing lines). A preference was indicated for going north of town. The only routing consideration mentioned for the area north of town is the small airfield, but no one thought it would be a significant constraint to line placement.

- Strong concerns were expressed regarding potential interference with television (TVI) and radio (RI) in Baker if the new line were routed close to town. Residents and tourists are very dependent on the radio for weather and road reports, and their television and radio signals are weak to begin with. Concerns about TVI and RI included:

    1. Their rebroadcast signal from Turquoise Mountain would cross in the vicinity of the proposed line, and the interference may make it weaker than it already is.

    2. It is important not to have RI along the highway. The major audience for Station KRXV in Daggett is tourists, and if the line caused serious RI along the highway, the station would be out of business.

3. Baker has three television channels: one from Las Vegas (80 miles), one from Victorville (100 miles), and one from Mt. Wilson (150 miles). Because of the distances of these signals from Baker, the slightest added interference could cause serious problems with reception.

- There seems to be some misunderstanding on the BLM-approved utility corridors in the Baker area. Some residents understood it to mean that there was a right-of-way in the area, in which other potential uses were currently restricted. We clarified the difference between a designated utility corridor and an actual right-of-way.

- Baker residents want to stay informed throughout the project, and would like periodic news releases for their local paper. Previous actions in the community (a hospital and a state prison proposal) were conducted without public information programs and no one was kept informed. They are very sensitive about being updated on project progress.

SIGN-IN SHEET

McCULLOUGH TO VICTORVILLE TRANSMISSION LINE PROJECT

PUBLIC MEETING

July 24, 1984

Baker, California

PLEASE PRINT

NAME	ADDRESS	PHONE NUMBER
Ann Price	P.O. Box 69 Baker 92309	733-4485
Lois Clark	P.O. Box 69 Baker 92309	733-4485
W. R. Locke	P.O. Box 313 Baker 92309	733-4312
A. Jacobson	Box 160 Baker 92309	733-4330
S. Zwerner	P.O. Box 130 Baker 92309	733-4375
S. Fitzgerald	P.O. Box 159 Baker 92309	733-4450
H.C. Fitzgerald	" " " " "	"
Jim Mieding	DWP	
Kemp Anderson	DWP	
Ed Freudenburg	DWP	
Garlyn Bergdale	Dames & Moore	
Lucy Bowen	Dames & Moore	

SCOPING MEETING SUMMARY
BARSTOW, CALIFORNIA
July 25, 1984

The need and general location of the proposed 500-kV line was described by Jim Mieding (DWP). He explained the purpose of these early scoping meetings and requested input on issues and concerns. Garlyn Bergdale explained the approach to the environmental study, and the I-15 corridor with two general alternatives to the Victorville/Adelanto area.

During the discussion of the environmental study, Peter Burk (Sierra Club) asked how the project will comply with NEPA. Bill Collins (BLM) explained that there has already been a great deal of environmental study done in the area. Two EISs have been prepared for the area along the I-15 corridor, which will be incorporated by reference into the environmental documents for this project. Additionally, Collins noted that both a northern and southern route were approved for the IPP line (the proposed line will go north of I-15).

Burk also explained what he perceives to be the real "need" for this and other transmission lines through San Bernardino County. He believes that, since California refused to allow construction of power plants when so many were being built across the country, there is now a lot of "excess energy" elsewhere that is being brought into California. Therefore, even though the state did not allow the environmental impacts of power plants, it must now face the problem of numerous transmission lines.

After the introductory remarks and discussion, comments and questions were solicited from the audience. Burk provided the majority of input, and made the following comments:

- It is the policy of the Sierra Club to advocate the upgrading of existing lines, rather than the construction of additional lines. (However, Burk did not advocate using the existing corridor in scenic areas). This was the purpose of the JUMP Plan. DWP should uprate the existing SCE line between McCullough and Coolwater. The Sierra Club strongly advocates co-use of lines and corridors. Burk indicated that the "reliability argument" against co-use of corridors does not really stand up.

- The Sierra Club is "very tired" of transmission lines that are built through San Bernardino County but provide no benefit to the area; the power is always shipped elsewhere.

- The East Mojave Scenic Area must be protected and kept as pristine as possible. This is the one area that they intend to protect (1.5 million acres). They will adamantly oppose <u>any</u> new lines through this area (Sierra Club and Citizens for Mojave National Park).

- Transmission lines throughout this area have limited Wilderness Study Areas, scenic areas, and other preservation efforts.

- Burk strongly urged that the new line go through Keany Pass and then drop south, not go south of I-15 at all, and avoid the East Mojave Scenic Area entirely.

- Burk asked whether the I-15 corridor is in the JUMP Plan (the response is that we believe it is).

- Another concern is the desert tortoise. There is a 200-square-mile area (Ivanpah) that has the second-highest tortoise density in the state (the highest density is in Kern County).

- The area on our map indicating an alternative into Victorville (southern alternative) has already been disturbed by recreational vehicles.

- When asked what the current status of the proposed Mojave National Park was, Burk said that two bills have previously gone to the U.S. Congress, and another will go soon. Currently, there is no pending legislation.

- Other concerns voiced by Burk include:

  1. White Fir forest (Clark Mountain).

  2. Raptor habitat (Clark Mountain).

  3. Bighorn sheep habitat.

  4. Anywhere south of I-15 you encounter tremendous wildlife habitat.

  5. Ecologically, the area is very unique: it is an area where the Colorado, Mojave and Sonora deserts come together (East Mojave Scenic Area).

  6. Petroglyphs at Halloran Wash should be avoided.

  7. The dinosaur track ACEC in the Mescal Mountains should be avoided.

  8. Cima Dome Joshua Tree Forest is very sensitive and is losing tree population. All alternative routes will affect it, but following the existing corridor will do the least additional damage.

- Conservation programs could be an alternative to construction, and should be a major part of this study.

- Other groups to be contacted include the California Native Plant Society, the Desert Protective Council, and the National Audubon Society.

SIGN-IN SHEET

McCULLOUGH TO VICTORVILLE TRANSMISSION LINE PROJECT

PUBLIC MEETING

July 25, 1984

Barstow, California

PLEASE PRINT

NAME	ADDRESS	PHONE NUMBER
Peter Burk - Sierra Club	P.O. Box 106, Barstow CA 92311	619-256-9561
Bill Collins - BLM	4027 Haverford Avenue, Riverside, CA	714-351-6373
D.M. Evans	2412 Cottage #24, Sacramento CA	916-488-0438
Sue Richardson - BLM	831 Barstow Road, Barstow CA	619-256-3595
Merrill McCarty - Desert Dispatch	130 Coolwater Lane, Barstow CA	619-256-2257
Jim Warren - SCE	30533 Rimrock Road, Barstow CA	619-252-6451
Charles W. Lopez	2053 Barcelona Circle, Barstow CA	619-252-4223
Jim Mieding	DWP	
Kemp Anderson	DWP	
Ed Freudenburg	DWP	
Garlyn Bergdale	Dames & Moore	
Lucy Bowen	Dames & Moore	

SCOPING MEETING SUMMARY
VICTORVILLE, CALIFORNIA
July 26, 1984

Jim Mieding (DWP) explained the need and general location of the proposed transmission line, and described the scoping process to be conducted throughout the project. Garlyn Bergdale (Dames & Moore) described the preliminary alternative corridors on the map, including the I-15 corridor and the two general alternatives to the Victorville/Adelanto area. He summarized the results of the three previous scoping meetings held this week in the study area.

The concerns and issues raised at the meeting were as follows:

- Several people commented that the proposed line should terminate at Adelanto rather than Victorville. They feel that the Victorville area already has too many transmission lines, and that there is not enough room for any more.

- A representative from Southern California Gas (SCG) expressed concern about transmission lines paralleling existing pipelines. He said SCG is experiencing problems with induced current in the Ludlow area, and that this could also happen in the Victorville area if the new line is routed through here. The induced current is affecting the cathodic protection in some sections of pipeline. He also stated that DWP has had to relocate portions of pipeline in the past, due to problems with induced current. SCG has detailed maps showing locations of all their pipelines in the study area, and they would like to provide this information to DWP.

- S.T. Older expressed concern that the proposed line avoid interference with airports and population centers in the study area. His preference is that the line go north of the IPP line and cross between I-15 and Highway 395, north of Township 8 North. This route would avoid Victorville Scoping Meeting

  Palisades Ranch Airport, Silver Lakes, the clear zones at George Air Force Base, and the Helendale Airport.

- The issue of undergrounding the transmission line was raised, and the costs, environmental considerations, and technical problems of undergrounding high-voltage lines were discussed.

- Bill Martin, who owns land near the Victorville Switching Station, stated that he lost the use of 14 of his 20 acres due to the IPP project. He does not want any more transmission lines on his property.

SIGN-IN SHEET

McCULLOUGH TO VICTORVILLE TRANSMISSION LINE PROJECT

PUBLIC MEETING

July 26, 1984

Victorville, California

PLEASE PRINT

NAME	ADDRESS	PHONE NUMBER
James C. Alexander	12722 Sycamore Street, Victorville 92392	619-949-0162
E. Alexander	" " " " "	"
Bill Martin	17193 Joshua Road, Apple Valley CA 92307	247-5604
Edmundo Aguero (?)	16736 Grant Street, Victorville	245-3411
Dale Woodward - SCE	P.O.Box 100, Long Beach CA 90801	213-491-2936
Roger Mann	P.O. Box 800, Rosemead, CA 91707	818-572-3023
M. Hoyt - So. Calif.Gas Co.	17071 Gasline Road, Victorville	245-1601
Chuck Graham	17258 Eureka, Victorville	245-5498
Mike Grarany (?)	Daily Press	245-7764
S.T. Older	Star Route Box 98, Oro Grande 92368	619-245-8889
Jim Mieding	DWP	
Carl Haase	DWP	
Kemp Anderson	DWP	
Ed Freudenburg	DWP	
Garlyn Bergdale	Dames & Moore	
Lucy Bowen	Dames & Moore	
Mike Yamada	DWP	

SUMMARY OF PUBLIC INFORMATION MEETINGS
March 1985

Summary of Issues, Concerns, Suggestions
Received at Public Information Meetings
for McCullough-Victorville/Adelanto Transmission Project

Four public information meetings were held in Boulder City, Adelanto, Baker, and Silver Lakes on March 4, 7, 12 and 13 respectively. These meetings were sponsored by the Los Angeles Department of Water and Power (DWP) to accomplish the following purposes:

- Inform participants as to project status and schedule;
- Review alternative routes and locations;
- Review environmental planning process; and
- Obtain information regarding specific concerns on alternative routes.

Notification of the workshops occurred in three primary ways: (1) meeting advertisements appeared in seven news publications Boulder City News, Las Vegas Review Journal, Baker Valley News, Silver Lakes Association Newsletter, Barstow Desert Dispatch, Victor Valley Daily Press, and The San Bernardino Sun; (2) a news release and map were distributed to the above print media and radio stations serving meeting location communities; and (3) handbills were distributed during the week of February 22, 1985 in Boulder City, Baker, Silver Lakes - Helendale, Adelanto, Kramer Junction, and Hinkley.

Each workshop began with a presentation by Jim Mieding, DWP, regarding the need for the project, its description, factors that will be considered in the final decision, the opportunities for public involvement, and the overall schedule. Garlyn Bergdale, of Dames & Moore, followed with a discussion of the environmental planning process required for the Environmental Report, and specifically addressed the potential environmental impacts along the various routes (see Attachment A for the presentation outline). After the presentation, questions and comments were taken from the group, and participants were encouraged to write their opinions and comments on a worksheet (Attachment B), and either submit it before leaving the meeting or send it to Carl Haase.

Over 50 people attended the workshops and their names and addresses are shown in Attachment C.

Written or verbal comments made at the workshops are summarized on the following pages. This summary is organized by meeting location and presents issues of concern expressed by one or more participants, alternative preferences, suggested route modifications, and general comments or follow-up suggestions.

SILVER LAKES

Issues of Concern

Visual Impact

- Use more aesthetic tower design; not lattice.
- Views from residences (particularly Link 24a).
- Follow existing corridors. (The reliability argument was questioned.)
- Visual quality of Mohave River, particularly bluffs crossed by Link 27.
- Consider undergrounding.

Impact on Future Growth

- 3,000 lots will eventually be developed at Silver Lakes with future population of 10,000.
- Development plans (not officially approved)
  - along Link 24a include:
    - 80-acre mini-ranch facing paved road (milepost 22).
    - mobile home subdivision (milepost 22).
    - 30-acre community hospital (milepost 21).
    - 40-acre mini-ranch (milepost 21).
    - 2.5-acre parcels for future ranchettes (milepost 17).
    - owner, Mr. Hinshaw, planning to build large home (milepost 18).
    - new homes being built (1 mile south of milepost 19).
  - along Link 24b include:
    - approximately 60 homeowners in vicinity.
  - along Link 27 include:
    - 2.5-acre home sites (mileposts 11-12).
    - mobile home sites (mileposts 4-7).
    - potential resort development associated with 2,200-acre Palisades Ranch (Steven Older of Upside Realty, 13799 Burning Tree Drive, Victorville, California, (619) 243-3071).

(Most of the above information provided by Robert Keevan of RV Realty, P.O. Box 39, Helendale, CA (619) 245-8362.)

Electrical Effects/Safety

- Low flying aircraft from George AFB.

- Children playing in vicinity.
- Potential health hazard.
- Helendale airstrip (Lockheed) approximately 2½ miles northeast of junction of Links 24b and 28.
- Radio and television reception were declared as marginal and guarantees were sought that the quality of reception would not be reduced. Jim Mieding explained that signal strength would be documented before and after construction and that if the transmission line did interfere with reception, DWP would, by one means or another, correct it.

Property Values

- Potential for negative impact.

No Direct Benefit to Silver Lakes

- Concerned that they bear the burden of the facilities but do not realize any benefits such as rate reduction.

Alternative Preferences

- Link 42.
- Link 41 and south down U.S. 395.
- Links 32 or 33 through Victorville.

Suggested Route Modifications

- None.

General Comments and Follow-Up

- Most participants in the meeting opposed either Links 24a or 27 primarily because of visual impacts and negative impact on future growth. Reaction to Link 24a was the most negative, since it is the closest.
- Most suggested routing through either Kramer Junction or Victorville because of the existing lines, with some people recognizing that Link 42 might be shorter and therefore less expensive to construct.

- Several individuals were concerned about the poor showing of Silver Lakes residents and took extra maps and comment sheets for their neighbors to complete and send to DWP.

- One individual requested that DWP appear at another meeting with County Supervisor, Mr. John Joyner.

- Mr. Keeran of RV Realty has much information on planned development in the area.

- Concerns were expressed that the alternate route map should appear in newspapers, to alert landowners along the proposed routes. In addition, it was suggested that DWP individually notify all landowners along Links 24a and 27.

- A petition with 110 signatures and 39 additional comment sheets were received from the Helendale/Silver Lakes residents opposing Links 24a and 27 for reasons that included impact on property values, views, television and radio reception. They support Links 33, 41 or 42.

ADELANTO

Issues of Concern

Visual Impact

- Scenic quality of Mohave River.

- Views for residences.

- Too many lines already near Victorville.

- Consider undergrounding lines.

- Consider the basin generation.

Access Roads

- Desert vegetation is very delicate and re-vegetation takes a long time. What steps will be taken to minimize environmental disturbance?

Confusion Over Current IPP Line Construction

- At river crossing tower construction sites, and Adelanto converter station.

Electrical and Health Effects

- Potential for health hazards?
- Radio and television interference.

Property Values

- Potential for negative impact.

No Direct Benefits to Adelanto Residents

- Some new construction jobs would be created, although more for a DC transmission line than for an AC transmission line.
- Any improvements to the city would depend on the impacts created by the project.
- City representative interested in possible tax benefits.

Document Review

- When, where, and for how long will the Draft Environmental Report be available for review?

Alternative Preferences

- Northern corridor from Barstow to Kramer Junction (Links 20, 41).

Suggested Route Modifications

- None.

General Comments and Follow-Up

- Most of the concern expressed focused on the addition of another large transmission line to an area with more than its share of lines. No specific follow-up seems necessary.
- The question was raised as to the timing for the AC/DC decision.

BAKER

Issues of Concern

Electrical Effects

- Television and radio interference (Link 9).
- Emergency vehicle signal interference (Link 9).
- Length of time for mitigation (i.e., lead time required to fix area's reception and transmission; possible requirement for an EA; time required to notify other users).

Impact on Future Growth of Baker Area

- Links 9 and 12 cut through the northern and southeastern corners of the 4½-square-mile Baker Community Service District (BCSD).
- BLM proposing to sell approximately 450 acres around Baker, a portion of which would be crossed by Link 9.
- Light industrial development (i.e., truck stop) planned for southern portions of BCSD.
- Future growth of BCSD will occur to north (Link 9).

Visual Impacts

- Link 10 directly impacts the Mohave scenic area while Links 10, 11 and 12 impact views into other scenic areas.
- Links 10, 11, 12, 13, 14, 15, 16 and 17 impact scenery north and south of I-15.
- Links 9, 10, 11 and 12 all impact Baker residents, particularly when northern corridor is available.
- Keep all transmission lines in same corridor (Link 6).
- Impact to natural scenery and recreational activities associated with Cady Mountains, Afton Canyon, and historic Mohave Trail.

Benefits to BCSD

- Short-term construction boom.

Reliability

- Why isn't reliability a problem on the southern route if it's a problem on the northern one?

- How many outages have occurred for all three lines since the Boulder corridor was established in the 1930s?

Alternative Preferences

- Link 6 because of existing corridor and no impact to people.

Suggested Route Modifications

- Move Links 10 and 12 farther south to miss BCSD boundaries.

General Comments and Follow-Up

- The northern corridor (Link 6) is preferable to routes around and/or adjacent to Baker.
- If the southern corridor is utilized, Links 10 and 12 must be re-routed to avoid BCSD.
- One alternative would be to follow Link 9 and cross south of Baker (Link 10) before following Links 12 and 13.
- Request DWP to take television and emergency signal reception measures before and after construction so that connection can be made if reception quality has decreased.

  The following test spots for television were decided:
  - Bumgardner residence - northeast.
  - Clark residence - northwest.
  - Easy-serve Texaco - southwest.
  - Dabney residence - southeast.
  - The Deli - central.
  - Off-ramps on the freeway for emergency vehicles.

BOULDER CITY

Issues of Concern

Public vs. Private Land

- Use public land whenever possible.

Appropriate Evaluation of Threatened and Endangered Species

- Specifically bighorn sheep and desert tortoise.

Alternative Preferences

- None expressed.

Suggested Route Modifications

- Re-route Link 5 to miss sections 8, 9 and 10 because of potential development of private land associated with existing stateline development.

General Comments and Follow-Up

- Electrical and visual differences between AC and DC systems were discussed.
- Concerns were expressed regarding biological effects of transmission lines, and the lack of evidence with for or against biological effects.

ATTACHMENT A

Appropriate Evaluation of Threatened and Endangered Species

- Specifically bighorn sheep and desert tortoise.

Alternative Preferences

- None expressed.

Suggested Route Modifications

- Re-route Link 1 to miss sections 3, 4 and 10 because of potential development of private land associated with existing recreational development.

General Comments and Follow-Up

- Electrical and visual differences between AC and DC systems were discussed.
- Concerns were expressed regarding biological effects of transmission lines, and the lack of evidence with for or against biological effects.

WORKSHOP PRESENTATION MATERIALS

McCullough-Victorville/Adelanto

Transmission Line Project

Siting and Construction of 500kV
Line from Boulder City, Nevada Area
to Victorville/Adelanto, California

Meeting Purpose

Presentation

- Project, schedule
- Overview of alternative routes
- Environmental planning process

Informal Discussions

- Specific public concerns

Project Participants

- Los Angeles Department of Water and Power
- Other southern California cities
- Modesto - Santa Clara - Redding
- Western Area Power Administration
- Salt River Project

Project Need

- Meet forecast need for power
- Reduce dependence on oil and gas
- Access economy energy market
- Enhance system reliability

Project Description

- 500kV transmission line
- 180 miles long
- lattice steel towers
- 200 foot right-of-way

Joint Environmental Report

- BLM - NEPA lead agency
- DWP - CEQA lead agency

Decision Factors for Route Selection

- Public Acceptability
- Engineering/Cost
- Environmental Impacts
- Right-of-Way Acquisition
- Reliability

Public Involvement

- Agency Contacts
- Public Scoping Meetings
- Community Workshops
- Public Hearings

Schedule

Subregional Studies	Spring 1984
Draft Environmental Report	Summer 1985
Public Hearings	Summer 1985
Final Environmental Report	Late 1985
Begin Right-of-Way Acquisition	1987
Begin Construction	1989-1990
Begin Operation	1991-1992

Planning Process

- Corridor Identification
- Baseline Inventory
  - Secondary data
  - Fieldwork
- Impact Assessment
- Mitigation Planning
- Route Selection

Environmentally Preferred Route(s)

- Impact level and significance
- Unavoidable adverse impacts
- Routing preference by resource
- Agency/public comments
- Cumulative environmental consequences

ATTACHMENT B

WORKSHEET

McCullough-Victorville/Adelanto
Transmission Line Project
March 1985

PLEASE PRINT

Name _____ Representative _____

Address _____ Telephone _____

_____

zip code

Circle the link(s) number nearest to your property.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
19 20 21 22 23 24a 24b 25 26 27 28 29 30 31 32 33 34 35
36 37 38 39 40a 40b 41 42 43

Comment on the location of the proposed routes in relationship to issues you consider important.

_____
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General comments on McCullough-Victorville/Adelanto Transmission Line Project.

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RESPONSE SHEET

Comments concerning the proposed McCullough-Victorville/ Adelanto 500-kV Transmission Line may be noted below and either left at the door or mailed to:

Mr. Carl D. Haase
Engineer of Environmental and
Governmental Affairs
Department of Water and Power
P.O. Box 111, Room 1121
Los Angeles, California 90051

Thank you for participating with the Los Angeles Department of Water and Power in this public information meeting for the McCullough-Victorville/Adelanto 500-kv Transmission Line.

Dear Mr. Haase:

My concerns on the proposed McCullough-Victorville/ Adelanto 500-kV Transmission Line are as follows:

Name _____

Address _____

City & Zip Code _____

Telephone ( ) _____

March 1985

ATTACHMENT C

McCullough-Victorville/Adelanto Transmission Line Project

Community Workshops
March 4-13, 1985

Boulder City, NV

1.	Thomas Rowland	3 Hillside Drive, Boulder City, NV	293-6033
2.	Chuck Saylor	Western Area Power Administration P.O. Box 200, Boulder City, NV 89005	(702) 293-8844
3.	Marge Taylor	1458 Sorrel Road, Boulder City, NV 89005	293-6640
4.	C. C. Morgan	1028 Neil Armstrong Circle, Las Vegas, NV 89128	363-3328
5.	Dennis Bechtel	Clark County Department of Comp. Planning 225 Bridger Avenue, Las Vegas, NV 89155	386-4181
6.	Stan R. Mendoze	452 Woodridge Drive	565-0353
7.	Huber Amstutz	1525 Sandea Drive	293-0090
8.	Gordon Smith	1317 Ramona, Boulder City, NV	294-1013
9.	Garlyn Bergdale	Dames & Moore	(602) 274-5548
10.	Ed Freudenberg	DWP	
11.	Jim Mieding	DWP	
12.	Kemp Anderson	DWP	

Adelanto, CA

1.	David Rumolo (RMI/MSR)	1010 Hurley Avenue, Sacramento, CA	(916) 924-1534
2.	Robert K. William	14801 Turner Road	246-7347
3.	Jim and Vee Alexander	12722 Sycamore Street, Victorville, CA 92392	949-0162

Community Workshops (continued)

Adelanto, CA (continued)

4.	Joe Garlock	12578 Sycamore Street, Victorville, CA 92392	949-0162
5.	Lydia Garlock	12626 Sycamore Street, Victorville, CA 92392	949-0590
6.	Chuck Saylor	Western Area Power Administration	
7.	Ina English	P.O. Box 349, Pinon Hills	(619) 868-5076
8.	Myrl Grabau	P.O. Box 1125, Phelan	(619) 244-0031
9.	Michael Hart	P.O. Box 1376, Victorville (Southern Calif. Gas)	245-1601
10.	Jim and Doris Robinson	18325 Shay Road, Victorville, CA 92392	246-5104
11.	Mary Scarpa	Box 576, Adelanto, CA	246-8317
12.	Mike Perry	15867 Bonanza Road, Victorville, CA 92392	245-8676
13.	John M. Sprinkler	P.O. Box 825, Adelanto, CA	
14.	Patricia A. Chamberlaine	P.O. Box 10, Adelanto, CA	246-8606
15.	Garlyn Bergdale	Dames & Moore	(602) 274-5548
16.	Marty Rozelle	Dames & Moore	(602) 274-5548
17.	John Robinson	Dames & Moore	
18.	Carl Haase	DWP	
19.	Jim Mieding	DWP	
20.	Kemp Anderson	DWP	
21.	Ed Freudenberg	DWP	
22.	Mike Yamato	DWP	

Community Workshops (continued)

Baker, CA

1.	Arne A. Jacobson	Box 27, Baker, CA 92309	733-4330
2.	J. Larry Collins	Box 156, Baker, CA 92309	(619) 733-4522
3.	John Bogacki/Alden Sievers, BLM	831 Barstow Road, Barstow, CA 92311	(619) 256-3591
4.	Chuck Saylor	Boulder City, NV 89005	(702) 293-8844
5.	Lois Clark	Box 69, Baker, CA 92309	(619) 733-4489
6.	W. R. Locke	P.O. Box 313, Baker, CA	733-4433, 4320
7.	Garlyn Bergdale	Dames & Moore	(602) 274-5548
8.	Marty Rozelle	Dames & Moore	(602) 274-5548
9.	Carl Haase	DWP	
10.	Jim Mieding	DWP	
11.	Ed Freudenberg	DWP	

Silver Lakes, CA

1.	George and Jane Beck	H.C. 1139, Helendale, CA 92342	243-1564
2.	Earl and Helen Bonnell	P.O. Box 248, Victorville, CA 92392	None
3.	David and Tris Askins	H.C. Box 2464, Helendale, CA 92342	245-9038
4.	Robert Wyse	P.O. Box 71, Helendale, CA 92342	(619) 245-4977
5.	Jim Stone	H.C. Box 2652, Helendale, CA 92342	243-5830
6.	S. T. Older	S.R. Box 98, Oro Grande 92368	245-8889
7.	Mirl Orebaugh	15250 Orebaugh Lane, Helendale, CA 92342	245-8861
8.	Mr. & Mrs. Martin Kurtz	27955 Fairacres-Silver Lakes, Helendale 92342	245-9454

Community Workshops (continued)

Silver Lakes, CA (continued)

9.	Mr. Salvatore Giambusso	H.C. Box 2358, Helendale, CA 92342	245-2500
10.	Mr. & Mrs. Sam Benson	14892 Fireside Lane, Helendale, CA 92342	245-6641
11.	William Marlo, Jr.	H.C. Box 1043, Helendale, CA 92342	245-9938
12.	Ed and Marge Peters	P.O. Box 93, Helendale, CA 92342	245-2145
13.	Tom and Grayce Horton	P.O. Box 9, Helendale, CA 92342	(619) 243-4453
14.	Robert V. Keeran	P.O. Box 39, Helendale, CA 92342	245-8362
15.	Vic and Leslie Bernard	P.O. Box 2390, Helendale, CA 92342	243-7819
16.	Robert Faulks (Daggett Chamber)	P.O. Box 255, Daggett, CA 92327	(619) 254-3132
17.	P.E. Brand	H.C. Box 2687, Helendale, CA 92342	(619) 243-1614
18.	Chuck Saylor	Western Area Power Administration	
19.	John Robinson	Dames & Moore	
20.	Garlyn Bergdale	Dames & Moore	(602) 274-5548
21.	Marty Rozelle	Dames & Moore	(602) 274-5548
22.	Carl Haase	DWP	
23.	Jim Mieding	DWP	
24.	Kemp Anderson	DWP	
25.	Ed Freudenberg	DWP	

Community Workshop (continued)

APPENDIX I-B
QUANTITATIVE IMPACT ASSESSMENT PROCEDURE

APPENDIX I-B
QUANTITATIVE IMPACT ASSESESMENT PROCEDURE

The majority of the impact assessment for the proposed Mead/McCullough-Victorville/Adelanto Transmission Project was done on a qualitative basis, as described in this report. However, for the purpose of clarifying the potential effectiveness of recommended, selective mitigation measures, impact levels were quantified during mitigation planning. This process is briefly described below.

After determining the qualitative impact levels (High, Moderate, Low and No Identifiable Impact), the Principal Investigator for each resource assigned a numeric value to each impact level. These values were assigned on the basis of the relative difference between the highest High (H+) impact and the lowest Moderate (M-) impact. For consistency, a numeric value of 5 was assigned to the lowest Moderate (M-) impact level for each resource.

The Principal Investigators then established their own Moderate and High impact scales, by determining the numeric value of their highest High (H+) impact in relation to the lowest Moderate (M-) impact. The H+ impact value was established as 10, 15, 20 or 25, depending on whether it was judged to be 2, 3, 4 or 5 times as great as the M- impact. Once the H+ and M- values were established, all intermediate values fell into place on an impact scale for each particular resource. Figure B-1 shows the scale on which all resource impacts were established.

Low impacts were assigned a numeric value of .1 to recognize potential impacts to the ambient environment, unless the Principal Investigator thought that such potential impacts were higher. In those cases, the highest Low impact (L+) was assigned a value of 1. A value of 0 was assigned to the No Identifiable Impact level.

These numeric values were used primarily because quantitative data lend themselves to clarifying the real effects of mitigation. There are some impacts that can be mitigated enough to make a <u>difference</u>, but not enough to drop the initial, qualitative impact level by an increment of one entire level (e.g., High to Moderate). In these cases, it is difficult to assess the real value and effectiveness of mitigation measures. However, when numeric values are assigned to qualitative impact levels, the effectiveness of mitigation is more readily apparent. The example below illustrates this concept.

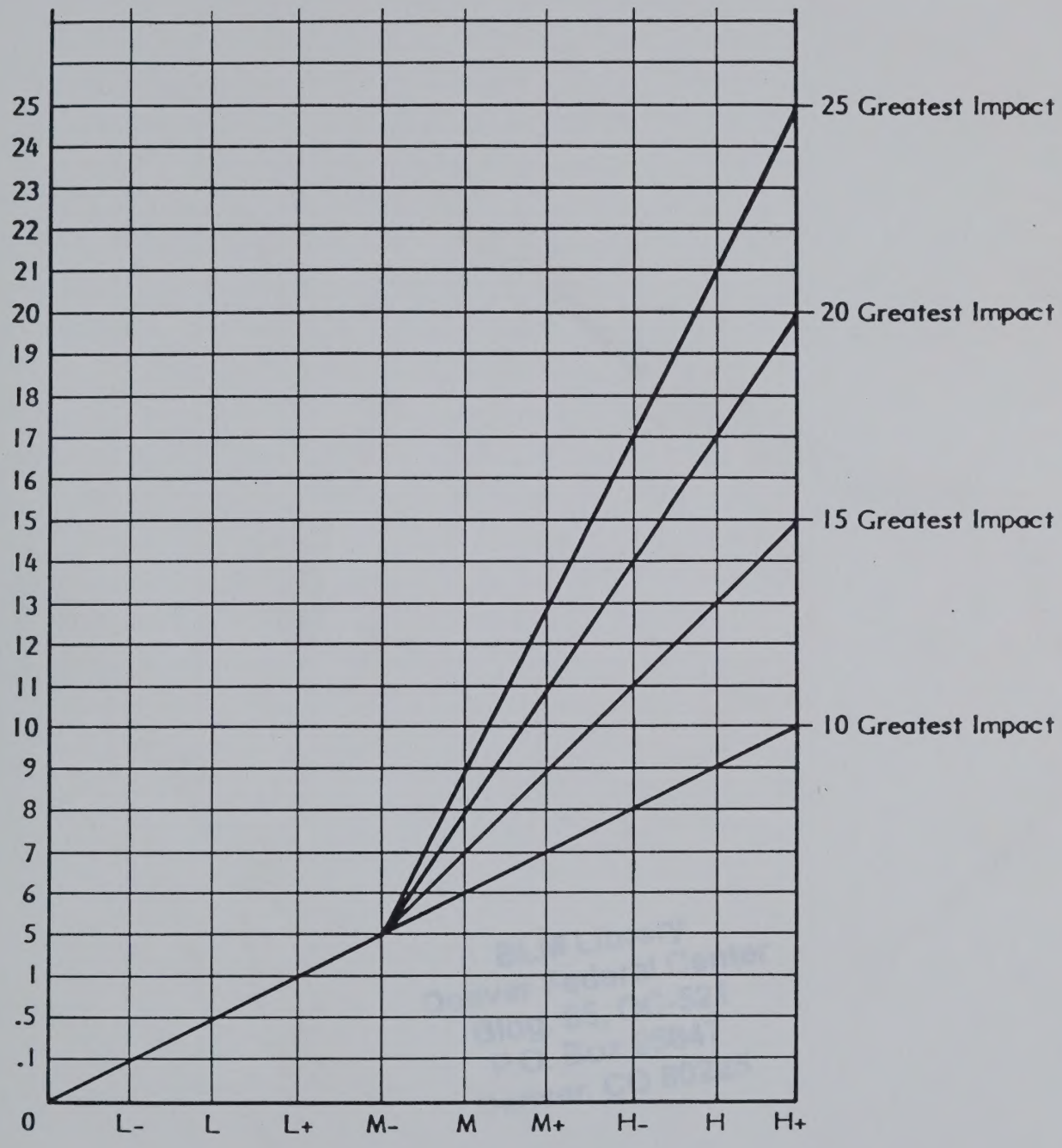
Assume that there are 10 miles of rural residential landscape along a transmission line route and that, because of proximity to houses and flat topography, those 10 miles are assigned High visual impacts. The mitigation measure of using non-specular conductor is recommended to reduce this impact. This measure will reduce the impact somewhat but, given the terrain and location of houses to the line, the impact will not drop as much as one entire impact level. In other words, the initial High impact level will be reduced through mitigation, but cannot be reduced to the next lowest qualitative level (Moderate).

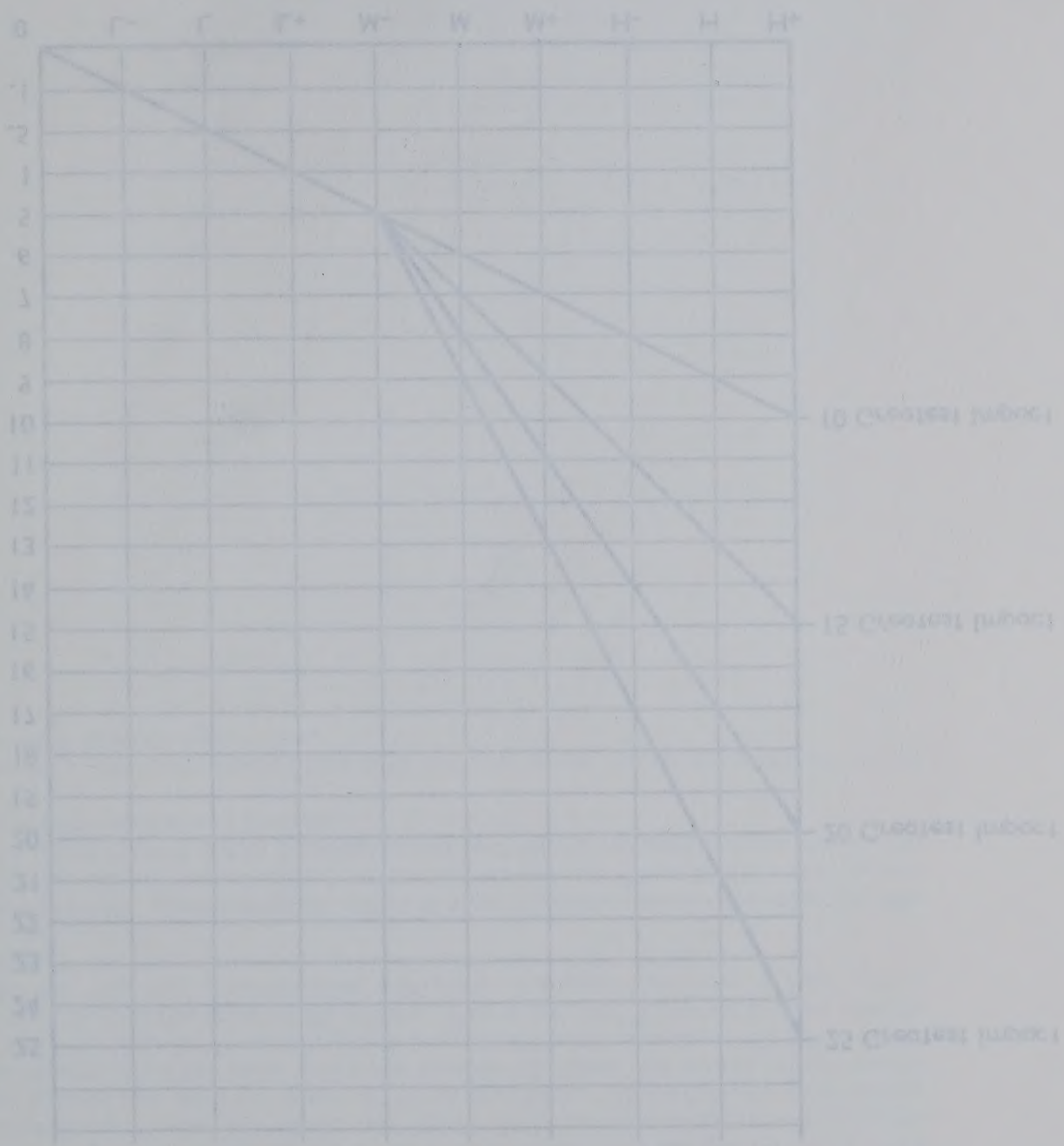
The problem with using only qualitative impact levels is that the effectiveness of recommended mitigation may not be apparent. Quantitative values, however, will show the difference between initial and mitigated impacts. Continuing the example above, if the initial impact was assigned a value of 25 on the impact scale (H+ scale, see Figure B-1), use of non-specular conductor may reduce that to a H- level, or 17 on the scale. Therefore, by multiplying the impact value per mile times the number of miles, the initial impact would be 250 (10 miles X 25 points), and the residual impact would be 170 (10 miles X 17 points)--a difference of 80 points. This quantified difference more readily indicates that the recommended mitigation measure does have a substantive effect.

Quantification gives decisionmakers a more tangible means of evaluating the effectiveness of recommended mitigation measures. Therefore, impact levels were quantified to aid in developing and evaluating mitigation measures during the impact assessment process.

Summary charts of quantitative data for alternative routes are available in the Dames & Moore project files.

TABLE B-1
IMPACT SCALE





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